

IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

Priority sites for Conservation

Revised and updated 2nd Edition Vol. II



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**Second Edition: Revised and Updated
Volume II**

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UTTARAKHAND



A.J.T. JOHNSINGH

Uttarakhand is known for lofty snow covered peaks forested hillsides and fast flowing river. The state has 6 National Parks, 7 wildlife sanctuaries. Many of them have been included in the list of 15 IBAs

Uttarakhand consists mainly of hilly areas which were earlier a part of Uttar Pradesh. Uttarakhand is bounded by Uttar Pradesh on the south, Nepal on the east, Himachal Pradesh on the west and China on the northeast. From the hilly districts of Uttarakhand two major Indian rivers originate, Ganga and Yamuna. The State has an area of 53,483 sq. km (1.6% of the India's geographical area).

Uttarakhand finds mention in the Hindu scriptures as *Kedarkhand*, *Manaskhand* and *Himavant*. It is often called the Land of Gods (*Dev Bhoomi*) because of its various holy places and shrines. The State was part of Uttar Pradesh, but after a long agitation for a separate Hill State by the people, it was separated from Uttar Pradesh to preserve the cultural, tribal, linguistic and social identities of the people belonging to these regions. Uttarakhand became the 27th State of the Indian Union on November 9, 2000 with Dehradun as its capital.

As per the 2011 Census, the total human population of Uttarakhand is 1,00,86,292. The urban population is 30.2%

and rural is 69.8%. The average population density is 189 persons per sq. km (2011 Census).

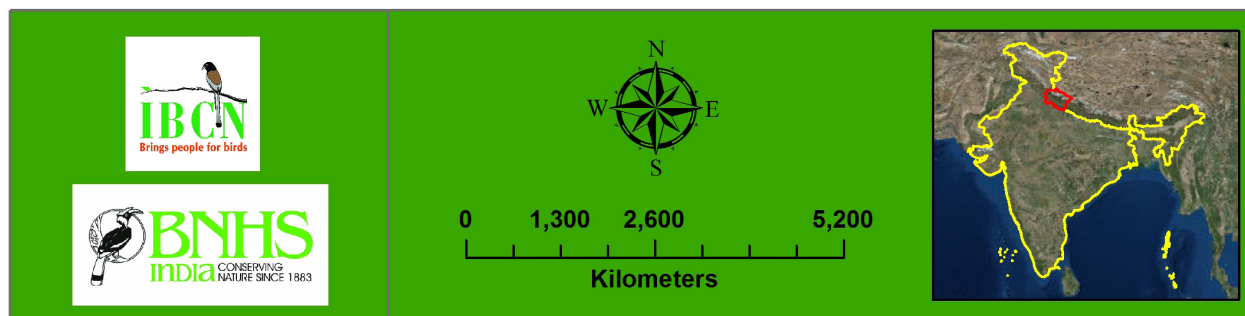
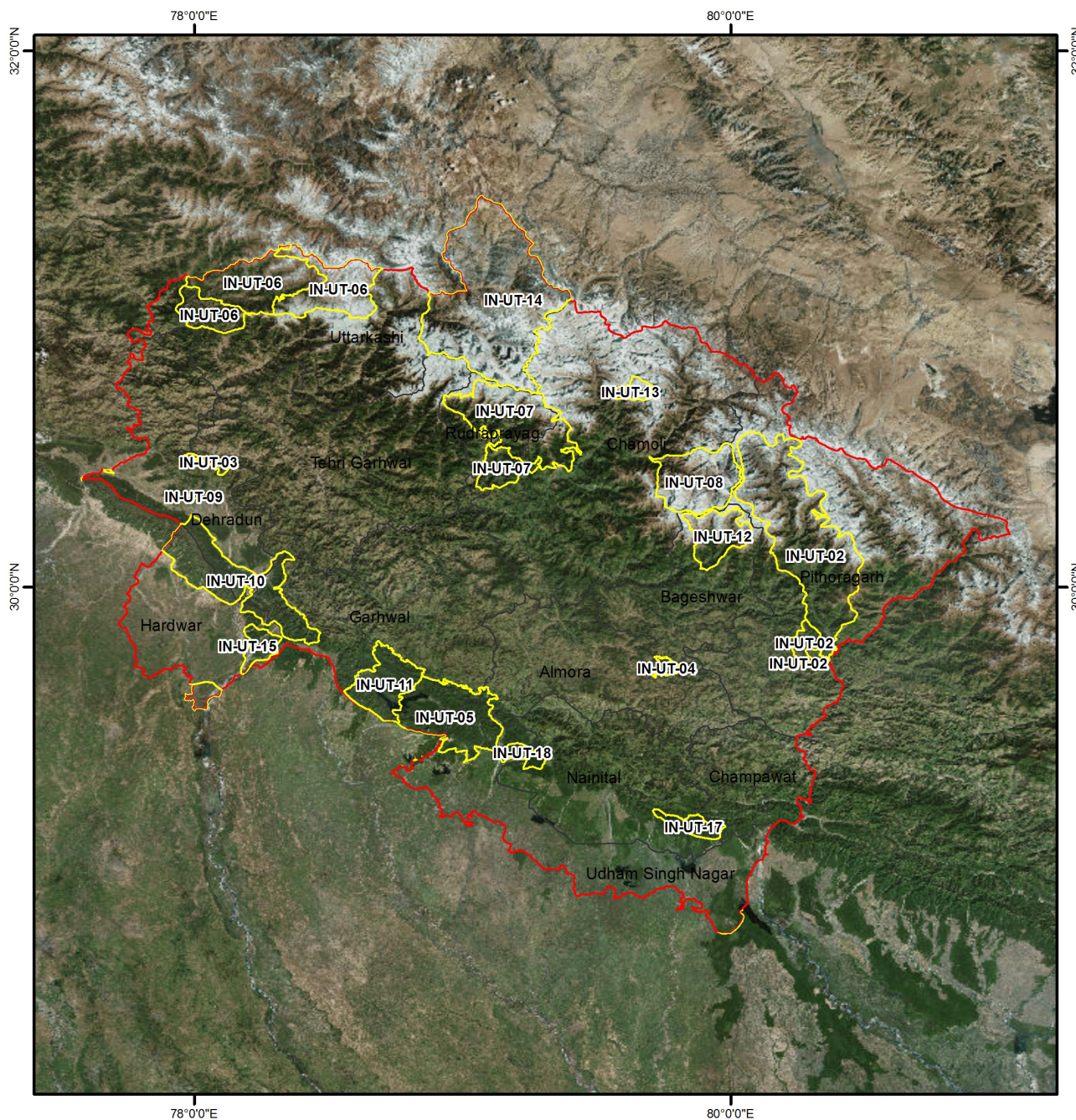
Vegetation

Uttarakhand ranks eighth amongst the States in terms of percentage of recorded forest area (Ministry of Environment and Forest 2011). As per the Ministry of Environment and Forest report 2001, the total forest area of the State is 34,65,100 ha, of which reserve forest is 24,64,300 ha (71.1%), protected forest 9,88,500 ha (28.5%) and unclassified forest is 12,300 ha (0.36%). The report also reveals that very dense forest cover constitutes 4,76,200 ha (8.9%), moderately dense forest cover 14,16,700 ha (25.6%), open forest cover 5,56,700 ha (10.4%) while scrub and non-forest constitute 55.1% of the State's area. The Nainital district has the highest forest cover (72.69%) followed by Champawat and Garhwal and other districts.

The main forest types of the State are Tropical Moist Deciduous, Tropical Dry Deciduous, Subtropical Pine,

Important Bird Areas in Uttarakhand

IN-UT



Himalayan Moist Temperate, Himalayan Dry Temperate, and Sub-alpine and Alpine Forests (Ministry of Environment and Forest 1999).

IBAs AND PROTECTED AREAS

Uttarakhand has six national parks, namely Corbett, Gangotri, Govind, Nanda Devi, Rajaji and Valley of Flowers. All these national parks are identified as IBAs. They constitute an area of 4,92,073 ha. The State also has seven wildlife sanctuaries: Askot (IBA), Binsar (IBA), Govind, Kedarnath (IBA), Mussoorie (Benog), Nandhaur and Sonanadi (IBA). Four of them have been identified as IBAs and together they cover an area of 1,90,377 ha.

The State has 15 IBA sites, including three non-protected areas namely Asan Barrage, New Forest Campus and Upper Pindar Catchment, and one recently added IBA, Pawalgarh Conservation Reserve.

The State has three conservation reserves: Asan, 444 ha, established in 2005 and inaugurated by the former President of India, the late Dr Abdul Kalam; Jhilmil Taal, about 38 sq. km, established in 2005 for the protection of Swamp Deer *Rucervus duvaucelii duvaucelii* and other grassland fauna, and Pawalgarh forest of 58.25 sq. km. established in 2012.

AVIFAUNA

In Uttarakhand, ten years ago 623 species of birds were recorded by Mohan and Sinha (2003). Since then, the number has increased to 686 species (Mohan and Sondhi 2014). This is due to an increase in the number of professional birdwatchers, increased accessibility to remote areas, and taxonomic changes that have split many species. This new list includes many vagrants, seen once or twice, and 28 species that have been recorded in old literature, but whose presence in the State is doubtful. One such bird is the Himalayan Quail *Ophrysia superciliosa* that is considered extinct.

Out of these 686 species, five are in the Critically Endangered category of BirdLife International/IUCN: Baer's Pochard *Aythya baeri*, Slender-billed Vulture *Gyps tenuirostris*, White-rumped Vulture *G. bengalensis*, Red-headed Vulture *Aegypius calvus*, and Himalayan Quail. Besides, two species are Endangered, 18 species are Vulnerable and 20 species are Near Threatened. Cheer Pheasant *Catreus wallichii*, Western Tragopan *Tragopan melanocephalus*, White-throated Tit *Aegithalos niveogularis* and Himalayan Quail *Ophrysia superciliosa* are restricted range species of the State. Some of the Threatened and Near Threatened species are marginal to the State which means that either there are stray records or the State forms a small part of their over-all distribution. For example, there is only one record of Baer's Pochard *Aythya baeri* from Asan Conservation Reserve and one unconfirmed record of Sociable Lapwing *Vanellus gregarious* (BirdLife International 2001).

THREATENED BIRDS FOR WHICH UTTARAKHAND IS VERY IMPORTANT

Himalayan Quail *Ophrysia superciliosa* Critically Endangered

The threat status of this enigmatic quail is extremely difficult to judge due to the paucity of information. If not extinct, its population is likely to be very small, and therefore it has been given the Critically Endangered status. The Himalayan Quail has been considered something of a mystery for many years. Despite calls for action and the resultant surveys, the species remains as enigmatic as it was at the beginning of the twentieth century (BirdLife International 2014). It was reported from Mussoorie in 1836, 5 km to the northwest between Badraj and Banog, 1,850 m (proposed IBA site) from where two males shot out of a covey of 8–10 individuals (Blyth 1867), and at Jharipani, 5 km to the south, c.1,650 m, (Hume and Marshall 1879–1881) and the last confirmed record was from the eastern slopes of Sher-ka-danda near Nanital.

Slender-billed Vulture *Gyps tenuirostris* Critically Endangered

This Vulture has been upgraded to Critically Endangered status because it has suffered an extremely rapid population decline, particularly across the Indian subcontinent (BirdLife International 2001) due to the pain-killer diclofenac given to livestock (Oaks *et al.* 2004). The vulture is exposed to the drug when it feeds on the carcass of an animal which has died within 72 hours after being administered diclofenac. The species has been recorded from Corbett Tiger Reserve, Rajaji National Park (Rahmani & Mohan 2013), New Forest (Mohan 1996), Nainital (Kazmierczak and Singh 1998), and Pithoragarh (J.A. Khan *pers. comm.* 2003).

Pallas's Fish-Eagle *Haliaeetus leucoryphus* Vulnerable

This species was once very common and widespread in Uttarakhand, but is now scarce and local. The main breeding populations are believed to be in China, Mongolia and the Indian subcontinent. It is believed to have declined significantly during the 20th century in China, Pakistan, India, Nepal, and Bangladesh. The population is likely to be over 10,000 mature individuals (BirdLife International 2014). It has been recorded from Asan Barrage, (Singh 2000, Gandhi and Singh 1995a, 1995b); Rajaji National Park (Pandey *et al.* 1994, Singh 2000) and Corbett National Park (BirdLife International 2014).

Cheer Pheasant *Catreus wallichii* Vulnerable

This pheasant's small population is naturally fragmented because it lives in small patches of successional grassland.



NEERAJ SRIVASTAVA

With increasing population and development, the fragile montane ecosystem of Uttarakhand is coming under pressure from expansion of agriculture (above) and hydro-power projects (below)



ASHISH KOTHARI

IBAs of UTTARAKHAND

IBA site codes	IBA site names	IBA criteria
IN-UT-01	Asan Conservation Reserve	A1, A4i
IN-UT-02	Askot Wildlife Sanctuary and Goriganga Basin	A1, A2
IN-UT-03	Binog Sanctuary-Bhadraj-Jharipani	A1, A2
IN-UT-04	Binsar Wildlife Sanctuary	A3
IN-UT-05	Corbett Tiger Reserve	A1
IN-UT-06	Govind National Park and Wildlife Sanctuary, Sandra, Kotigad and Singtur ranges (Tons forest division)	A1, A2
IN-UT-07	Kedarnath Musk Deer Sanctuary & surrounding Reserve Forests	A1, A2, A3
IN-UT-08	Nanda Devi Biosphere Reserve	A1, A2
IN-UT-09	New Forest Campus	A3
IN-UT-10	Rajaji National Park	A1
IN-UT-11	Sonanadi Wildlife Sanctuary	A1
IN-UT-12	Upper Pindar Catchment Area	A1, A2, A3
IN-UT-13	Valley of Flowers National Park	A1
IN-UT-14	Gangotri National Park	Data Deficient
IN-UT-15	Jhilmil	
IN-UT-16	Naina Devi Himalayan Bird Conservation Reserve	
IN-UT-17	Nandhour Wildlife Sanctuary	
IN-UT-18	Pawalgarh Conservation Reserve	A1, A3

A1= Threatened species; A2 = Restricted Range species; A3= Biome species; A4=Congregatory species

LIST OF THREATENED BIRDS WITH IBA SITE CODES

CRITICALLY ENDANGERED

Baer's Pochard	<i>Aythya baeri</i>	IN-UT-01
Himalayan Quail	<i>Ophrysia superciliosa</i>	IN-UT-03 (Extinct?)
White-rumped Vulture	<i>Gyps bengalensis</i>	IN-UT-01, 05, 10, 11, 15, 16, 17
Slender-billed Vulture	<i>Gyps tenuirostris</i>	IN-UT-01, 05, 10, 11, 16, 17, 18
Red-headed Vulture	<i>Aegypius calvus</i>	IN-UT-01, 05, 10, 11, 16, 17, 18

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>	IN-UT-01, 10, 15, 16, 17, 18
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-UT-01, 05, 10, 11, 15

VULNERABLE

Cheer Pheasant	<i>Catreus wallichii</i>	IN-UT-02, 03, 06, 07, 08, 12, 14, 16
Western Tragopan	<i>Tragopan melanocephalus</i>	IN-UT-06
Lesser White-fronted Goose	<i>Anser erythropus</i>	IN-UT-01
Marbled Duck	<i>Marmaronetta angustirostris</i>	IN-UT-01
Long-tailed Duck	<i>Clangula hyemalis</i>	IN-UT-01
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-UT-05, 11, 15
Asian Woollyneck	<i>Ciconia episcopus</i>	IN-UT-01, 18
Pallas' Fish-Eagle	<i>Haliaeetus leucoryphus</i>	IN-UT-01, 05, 10, 11, 17
Eastern Imperial Eagle	<i>Aquila heliaca</i>	IN-UT-05, 11, 16
Indian Spotted Eagle	<i>Aquila hastata</i>	IN-UT-05, 10
Greater Spotted Eagle	<i>Clanga clanga</i>	IN-UT-01, 05, 10, 11, 16
Sarus Crane	<i>Grus antigone</i>	IN-UT-05
Wood Snipe	<i>Gallinago nemoricola</i>	IN-UT-05
Grey-crowned Prinia	<i>Prinia cinereocapilla</i>	IN-UT-03, 05, 16
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>	IN-UT- 05, 10, 11, 17
Bristled Grassbird	<i>Chaetornis striata</i>	IN-UT-05, 10, 15
Yellow Weaver	<i>Ploceus megarhynchus</i>	IN-UT-05

NEAR THREATENED		
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-UT-05
Satyr Tragopan	<i>Tragopan satyra</i>	IN-UT-02, 12
Falcated Duck	<i>Anas falcata</i>	IN-UT-01, 10
Ferruginous Duck	<i>Aythya nyroca</i>	IN-UT-01, 05, 10
Painted Stork	<i>Mycteria leucocephala</i>	IN-UT-01, 05, 10, 11, 18
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	IN-UT-01, 05, 10, 11, 15
Oriental Darter	<i>Anhinga melanogaster</i>	IN-UT-01, 05, 10, 11, 18
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	IN-UT-01, 05, 11, 17,
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>	IN-UT-05, 10, 11, 17
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>	IN-UT-05, 10, 11
Cinereous Vulture	<i>Aegypius monachus</i>	IN-UT-01, 05, 10, 11, 17, 18
Bearded Vulture	<i>Gypaetus barbatus</i>	IN-UT-08, 10, 12, 13, 16, 18
Himalayan Griffon	<i>Gyps himalayensis</i>	IN-UT-08, 10, 12, 13, 14, 16, 18
Pallid Harrier	<i>Circus macrourus</i>	IN-UT-05, 11
Black-tailed Godwit	<i>Limosa limosa</i>	IN-UT-01
Great Thick-knee	<i>Esacus recurvirostris</i>	IN-UT-05
River Lapwing	<i>Vanellus duvaucelii</i>	IN-UT-05, 10, 17, 18
River Tern	<i>Sterna aurantia</i>	IN-UT-10, 15, 18
Blossom-headed Parakeet	<i>Psittacula roseata</i>	Very common in many IBAs and outside IBAs
Alexandrine Parakeet	<i>Psittacula eupatria</i>	Very common in many IBAs and outside IBAs
Red-breasted Parakeet	<i>Psittacula alexandri</i>	Very common in many IBAs and outside IBAs
Yellow-rumped Honeyguide	<i>Indicator xanthonotus</i>	IN-UT-07, 08, 13
Great Pied Hornbill	<i>Buceros bicornis</i>	IN-UT-05, 10, 11, 15, 17, 18
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>	IN-UT-15
Tytler's Leaf-warbler	<i>Phylloscopus tytleri</i>	IN-UT-03, 10

Human population pressure, and hunting and changing patterns of land use leading to its decline qualify the bird species as Vulnerable. In Uttarakhand it has been reported from Kedarnath Sanctuary (Sathyakumar *et al.* 1992), Banog, (Kaul *et al.* 1998), Nanda Devi Biosphere Reserve (BirdLife International 2001), Binsar Wildlife Sanctuary (Ilyas 1998), Jhitad village near Tiuni in Dehradun, grasslands at Binayak near Nainital and calls have been heard from Chenab valley in Chamoli district (Rahmani & Mohan 2013)

RESTRICTED RANGE SPECIES

Parts of Uttarakhand fall in the Endemic Bird Areas of Western Himalaya (EBA 128), where 11 restricted range species have been reported of which only six are confirmed from this State but more are likely to be found. These species breeds in Temperate Forests including Coniferous, Broadleaf and Mixed Broadleaf-coniferous, and some of them range into adjacent Montane Grassland and Sub-alpine Forest

(Statterfield *et al.* 1998). The key threats to the region are moderate habitat loss (e.g. due to timber extraction).

BIOMES

Uttarakhand has four biomes.

Biome 5 (Eurasian High Montane, Alpine and Tibetan): BirdLife International (undated) has listed 48 species, out of which 18 species have been recorded in Uttarakhand, but more are likely to be found.

Biome 7 (Sino-Himalayan Temperate Forest): This large biome covering many countries has Broadleaf Evergreen, Broadleaf Deciduous, Mixed Broadleaf-coniferous forests, and Montane grassland, mainly between 1,800 m and 3,600m. BirdLife International (undated) has listed 112 species, out of which 57 species have been recorded in Uttarakhand till now.

Biome 8 (Sino-Himalayan Subtropical Forests): This is another large biome straddling many countries, and occurs between c. 1,000 and 2,000 m. Ninety-five birds have been

Avian species of Endemic Bird Area 128 reported from Uttarakhand with threat category and IBA site code		
Himalayan Quail	<i>Ophrysia superciliosa</i>	CR IN-UT-03 (Extinct ?)
Cheer Pheasant	<i>Catreus wallichii</i>	VU IN-UT-02, 03, 06, 07, 08, 12, 14
Western Tragopan	<i>Tragopan melanocephalus</i>	VU IN-UT-06
Tytler's Leaf-warbler	<i>Phylloscopus tytleri</i>	NT IN-UT-03
White-throated Tit	<i>Aegithalos niveogularis</i>	LC IN-UT-02, 06, 07, 08, 12
Spectacled Finch	<i>Callacanthis burtoni</i>	LC IN-UT-03



Goral is split in to three species. In Uttarakhand, Himalayan Goral *Nemorhaedus goral* is found in many IBAs

identified that represent this biome. In Uttarakhand 27 species have been recorded.

Biome 11 (Indo-Malayan Tropical Dry Zone). Although geographically this biome does not occur in Uttarakhand, many species of this biome are found in Uttarakhand. Till now 33 species have been recorded by Mohan and Sinha (2003), but perhaps more are found.

The combined biome list is too long to be mentioned here.

SOME NEW RECORDS FOR UTTARAKHAND

Bean Goose *Anser fabalis*

Bean Goose is a winter vagrant in India, Nepal and Bangladesh. Previous records include a single bird from Harike Lake, Punjab in 2003, and a single bird from Dibru Saikhowa National Park, Assam in 2007. A Bean Goose was seen in a flock of Bar-headed Goose *Anser indicus* in Tumariya reservoir, near Corbett Tiger Reserve (Bhattacharjee 2013).

Mandarin Duck *Aix galericulata*

Mandarin Duck is a rare winter visitor to India. Records of this bird have been made mainly from northeast India, particularly from Assam and twice from Manipur, the latest sighting by Kasambe & Singh (2014). In 1999 three birds (one male and 2 female) were observed at Sat Tal Lakes in Uttarakhand by Vrezec *et al.* (2005). Since then no birds

have been reported from state.

Red-tailed Wheatear *Oenanthe chrysopygia*

Sharma & Chaturvedi (2010) recorded second sighting of this bird from the State, the first being from Rajaji National Park in 1994.

THREATS AND CONSERVATION ISSUES

The IBA sites of Uttarakhand face several problems such as poaching of birds, deforestation, irresponsible tourism and encroachments. For example, in Asan Barrage, several factors are contributing to the deterioration of ecological conditions. The rapid spread of *Typha*, *Ipomea* and *Eichhornia crassipes* is a serious problem, since eradication of these weeds is not undertaken regularly. The problem of soil erosion in the catchment areas of both the Asan and Yamuna rivers is acute, and the reservoir silts up rapidly. Already large parts of the wetland are silted up and are being subjected to the spread of terrestrial weeds such as *Lantana*. Heavy traffic between Dehradun and Paonta Sahib through the Asan Barrage causes a lot of disturbance to migratory waterfowl. The district administration and the Irrigation Department have agreed to divert the traffic through Timli-Paonta via Herbertpur. Some poaching takes place, away from the main reservoir. Posting some forest guards, at least during winter months, could easily stop this.

In the Askot Wildlife Sanctuary, a large proportion of the

land is privately owned, and the revenue department has made the Sanctuary a difficult area to protect administratively and legally. Askot suffers high anthropogenic pressure from the 109 villages in its vicinity, with a population of about 58,967, most of who are dependent on fuel, fodder and other resources from the Sanctuary. Grazing is also affecting the Sanctuary, especially in the alpine areas and there is competition between the wild herbivores and domestic livestock. Approximately 84,000 livestock graze in the Sanctuary throughout the year. Resin is tapped from trees in the lower altitudes. Poaching of musk deer and other wildlife occurs in the higher altitudes, and there is illegal cross-border trade of medicinal plants, bear bile and musk. A series of dams are proposed on the Gori-Ganga by the National Hydroelectric Power Corporation. While construction in the adjacent Darma basin is nearing completion, the work on Gori-Ganga is proposed to start soon. There is a possibility that a part of the Askot Wildlife Sanctuary may be denotified to accommodate the dams.

Collection of medicinal plants from the Binsar Wildlife Sanctuary is one of the main threats to biodiversity. The villagers use 50 plant species in Binsar as medicine (Ilyas 1998).

Although the Corbett Tiger Reserve is famous for mammalian fauna, it is a very important site for birds too. This famous Park also faces many long term problems. The main ones are the irreversible changes in habitat due to the construction of a reservoir across the Ramganga river, and movement of elephants and tigers across the Ramganga river, south of the reservoir, from Corbett National Park to Kalagarh Reserve Forest (Sonanadi Wildlife Sanctuary). Occasionally, tigers and elephant bulls come down from the Reserve along the Sukha-sot, which is to the right (east) of the Kalagarh-Saddle Dam road, to the Ramganga river and cross over to Kalagarh. The Kalagarh project and township was built on 90 sq. km of forest land, and according to an agreement between the Irrigation and Forest Departments, 3.5 sq. km of this area should have been vacated and returned to the Forest Department soon after the completion of the construction of the reservoir. After much persuasion, 3.1 sq. km of land was returned by the Irrigation Department. The remaining area (0.4 sq. km) has colonies with about 4000–5000 encroachers. Now, the Forest Department, supported by NGOs, has filed cases against 724 individuals, to evict them and their families, and the case is in the court of the Sub-Divisional Magistrate, Kotdwar. The encroachers in the Kalagarh colony should be evicted, which will be possible only when the Government of India, the Government of Uttarakhand and NGOs interested in the conservation of Corbett Tiger Reserve work together. The Sukha-sot area needs total protection from disturbances such as wood cutting from Bikkhawala village with a population of about 1200 people.

The foremost problem for the Rajaji National Park is related to the people living inside it. One major community, namely *Gujjar*, lives inside the Park in scattered *dheras* (settlements). The resettlement of the *Gujjars* has been a major issue related to the Rajaji NP for nearly three decades, with the matter being taken to the Supreme Court. Despite clear directives from the Court, their resettlement has not been completed. The Kedarnath Wildlife Sanctuary does not require any habitat improvement through human intervention. The best habitat improvement can be achieved by regulating grazing. The *Gujjars* who have recently made inroads into the area must be diverted to other grazing areas because grazing livestock can lead to permanent degradation of this fragile habitat. The Hindu temples in the Sanctuary are of great cultural value. They attract thousands of pilgrims every year who exert tremendous pressure on the fragile resources of this IBA.

Upper Pindari is a very important birding area which is not yet properly explored for birds. This area needs to be declared a Wildlife Sanctuary, both on account of its rich biodiversity and the low biotic pressure in the area. The uppermost village in the Valley is Khati (c. 2200 m), situated at the confluence of Pindar and Sunderdhunga Gad. The trek to the Pindari glacier is one of the most popular treks in Uttarakhand. The Forest Department and the Kumaon Mandal Vikas Nigam need to work together to organise the trekking activity so that it is ecologically acceptable. The area has great potential to become a centre for conservation education in the Himalaya.

There is also considerable potential for extending the Govind Wildlife Sanctuary eastward, which would enhance its conservation values, especially if its management is integrated with that of the adjacent Chitkul-Raksham Sanctuary in Himachal Pradesh; Kulni and Balcha reserve forests could also be included. Prasad (1993) has advocated the declaration of a 35,000 ha Western Tragopan Sanctuary in the upper catchment area of the Pabar and the Rupin rivers. This proposed sanctuary, along with the existing protected area and the adjoining Chitkul-Rakcham Sanctuary, has the potential to be declared as one large conservation unit (S. Sathyakumar *pers. comm.* 2003).

Highest priority should be given to issue the final notification of the Binog Mountain Quail Wildlife Sanctuary so that there is no ambiguity about its protected status. As the area is very close to Mussoorie, a major tourist centre, an interpretation centre should be developed, with major focus on the Critically Endangered Himalayan Quail and Himalayan fauna. It could become a good place for disseminating conservation education. There should be intensive efforts to rediscover the Himalayan Quail. Experts could try a poster campaign along with the involvement of a large number of local people. Habitat management in the Sanctuary should also be guided by the habitat requirements of this bird.

On June 16 and 17, 2013 Uttarakhand received heavy down pour which was accompanied by bursting of a moraine dammed lake Chorabari, resulting in the flooding of the Saraswati and Mandakini rivers in Rudraprayag district of Uttarakhand. This damaged the banks of the River Mandakini for 18 km between Kedarnath and Sonprayag, and completely washed away Gaurikund (1,990 msl), Rambara (2,740 msl) and Kedarnath (3,546 msl) towns (Dobhal *et al.* 2013). Even the Valley of Flowers was affected. The loss of human life was immense; damage to property and livestock was incalculable. These devastating floods and landslides were country's worst natural disaster since the 2004 tsunami (Durga Rao *et al.* 2014). Since this disaster, the Government of Uttarakhand has taken many conservation measures to stop deforestation as the later aggravates the situation. We hope that these conservation measures will also result in better management of the IBAs, and more involvement of local communities.

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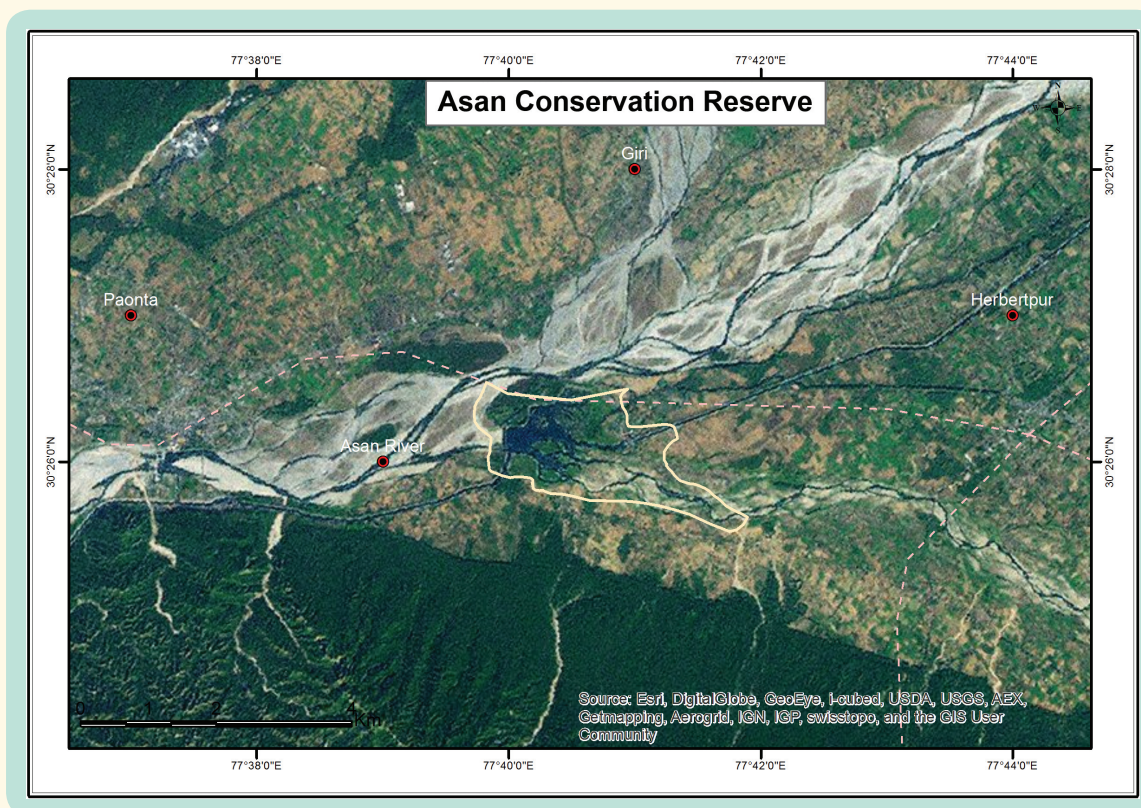
ASAN CONSERVATION RESERVE

IN-UT-01

IBA Site Code	: IN-UT-01	Altitude	: 400 msl
State	: Uttarakhand	Rainfall	: 1,500 mm
District	: Dehra Dun	Temperature	: 14 °C to 38 °C
Area	: 444 ha	Biogeographic Zone	: Gangetic Plains
Ownership	: State (Uttarakhand Jal Vidyut Nigam Ltd and Forest Department)	Habitats	: Freshwater Reservoir, Perennial River and boulder-strewn river bed, Riverine Forests
Coordinates	: 30° 25' 60" N, 77° 42' 00" E		

IBA CRITERIA : A1 (Threatened species), A4i (Congregation: ≥1% biogeographic population)

PROTECTION STATUS : Conservation reserve.



GENERAL DESCRIPTION

The Asan Conservation Reserve, near village Dhalipur 38 km from Dehra Dun, is located at the confluence of the Yamuna hydel canal (from Dak Pathar which was built in the mid 1960s) and Asan river (a small rain-fed tributary of the Yamuna). It was declared as the first conservation reserve of India in 2005 and includes a freshwater reservoir of approximately 100 ha and surrounding varied habitats, totaling 444 ha. The reservoir is managed by the Uttarakhand Jal Vidyut Nigam Limited (UJVNL) while the entire area is managed by the Chakrata Forest Division. When the water level is moderate, it provides good habitat for waterfowl.

The dominant aquatic vegetation comprises *Potamogeton pectinatus*, *Typha elephantina*, and *Ceratophyllum demersum*. The forested parts of the conservation reserve are covered with riverine forests of *Dalbergia sissoo* and *Acacia catechuoides*. The southern side of the barrage is surrounded by agricultural fields. Further south, there is mixed forest typical of the Shivalik hills, consisting chiefly of *Shorea robusta*, *Anogeissus latifolia*, *Lannea coromandelica*, *Dalbergia sissoo*, and *Bombax ceiba*. Some parts of the reservoir are covered with weeds *Eichhornia crassipes* and *Ipomoea fistulosa* (Kumar & Porwal 1998).

CRITICALLY ENDANGERED

Baer's Pochard	<i>Aythya baeri</i>
White-rumped Vulture	<i>Gyps bengalensis</i>
Slender billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Marbled Teal	<i>Marmaronetta angustirostris</i>
Lesser White-fronted Goose	<i>Anser erythropus</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Black-tailed Godwit	<i>Limosa limosa</i>

AVIFAUNA

This IBA has a 30-year old nesting site of the Vulnerable Pallas's Fish-eagle *Haliaeetus leucoryphus*. During winter, it is not unusual to count up to 5,000 waterfowl, with high species diversity, as Asan Barrage has both shallow and deep water and the River Yamuna flows close by. Ruddy Shelduck *Tadorna ferruginea*, Mallard *Anas platyrhynchos*, Wigeon *Anas penelope*, Gadwall *Mareca strepera*, Northern Shoveller

A. clypeata and Common Teal *Spatula crecca* are commonly seen, along with Red-crested Pochard *Netta rufina*, Common Pochard *Aythya ferina*, and Tufted Duck *A. fuligula*. It is one of the best places for large congregations of Ruddy Shelduck (Kumar & Porwal 1998) and other birds (Gandhi & Singh 1995a, b; Singh 2000). On February 12, 2003, more than 2,000 were seen (Arun P. Singh, *pers. comm.* 2003). The 1% threshold for this species is 500 (Wetlands International 2012), so the population in this IBA exceeds the threshold four times, thus the site also qualifies for A4i criteria.

Raptors recorded in this IBA include the Osprey *Pandion haliaetus*, Marsh Harrier *Circus aeruginosus*, Steppe Eagle *Aquila nipalensis*, Oriental Honey-buzzard *Pernis ptilorhynchus*, and Changeable Hawk-eagle *Spizaetus cirrhatius*. Being located towards the northwest and serving as a halt for Trans-Himalayan migratory birds, Asan Barrage receives waterfowl migrants which are rare elsewhere. These include the Black-necked Grebe *Podiceps nigricollis* and Great Crested Grebe *P. cristatus*. Other rare records include Common Shelduck *Tadorna tadorna*, Black-necked Stork *Ephippiorhynchus asiaticus*, and Black-bellied Tern *Sterna acuticauda*. Altogether, more than 250 species have been recorded in this IBA, including many globally threatened and Near Threatened ones (Mohan *et al.* 2009).

OTHER KEY FAUNA

Except for Common Otter *Lutra lutra*, there is no mammal of conservation concern. The Fishing Cat *Prionailurus*



Perhaps the largest flock of Brahminy Duck *Tadorna ferruginea* found anywhere in India is found in Asan Barrage. Sometimes up to 2,000 are seen together

viverrina could be present but there are no confirmed records. Asiatic Elephant *Elephas maximus* occasionally visits the IBA from the adjoining Shivalik forests.

LAND USE

- Hydro-electricity
- Conservation of biodiversity
- Tourism

CONSERVATION ISSUES

- Spread of invasive species
- Non-sustainable tourism
- Draining of water at wrong time
- Poaching

At present, several factors are contributing to the deterioration of ecological conditions in the Asan reservoir. The rapid spread of *Typha*, *Ipomoea*, and *Eichhornia crassipes* is a serious problem, since attempts to eradicate these invasive species are not undertaken regularly. The problem of soil erosion in the catchment areas of both Asan and Yamuna rivers is acute. Thus large parts of the wetland are silted up and subjected to spread of terrestrial invasives such as *Lantana*. The water management regime of the irrigation department is unfavourable to the avifauna. The barrage is sometimes drained in the winter for repair and maintenance when it is full of waterfowl, forcing them to abandon the wetland. This desilting should be done after March 15. The Garhwal Mandal Vikas Nigam (GMVN) Ltd. promotes the site for water sports, which causes disturbance to the waterfowl. The use of motor boats has been banned since the area has been declared as a conservation reserve.

Heavy traffic between Dehra Dun and Paonta Sahib through the Asan Barrage causes much disturbance to migratory waterfowl. The district administration and the UJVNL have agreed to divert the traffic through Timli-Paonta via Herbertpur. Poaching is known to take place rarely, away from the main reservoir. Posting forest guards, at least during the key winter months, could easily stop this.

A detailed management plan was written (Mohan *et al.* 2009) for the period 2009–2010 to 2013–2014 which has to a great degree streamlined the management of the reserve.

KEY CONTRIBUTORS

Arun P. Singh, Dhananjai Mohan, S.S. Gandhi.



A pair of Pallas's Fish-eagle *Haliaeetus leucoryphus* nests near Asan Barrage

DHRTIMAN MUKHERJEE

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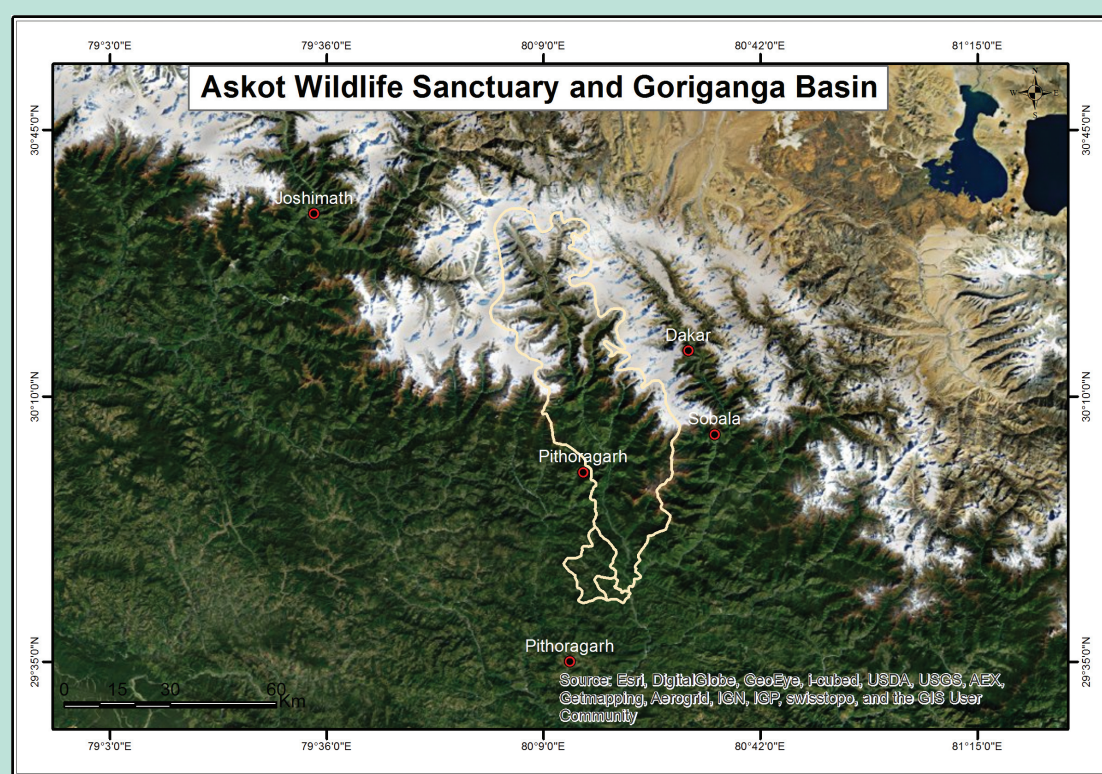
ASKOT WILDLIFE SANCTUARY AND GORIGANGA BASIN

IN-UT-02

IBA Site Code	: IN-UT-02	Rainfall	: 150–3,000 mm (low rainfall is in glaciers)
State	: Uttarakhand	Temperature	: 0 °C to 30 °C
District	: Pithoragarh	Biogeographic Zone	: Himalaya
Area	: 2,09,993 ha (59,993 ha + 150,000 ha)	Habitats	: Montane Wet Temperate Forest, Alpine Moist Scrub, Subalpine Forest
Ownership	: State		
Coordinates	: 29° 40' 46" N, 80° 16' 28" E		
Altitude	: 700–7,000 msl		

IBA CRITERIA : A1 (Threatened species), A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS: Wildlife Sanctuary, established in July 1986.



GENERAL DESCRIPTION

Askot Wildlife Sanctuary in Pithoragarh district lies at the junction of the Western and Central Himalaya and covers three biomes: Eurasian High Montane (Alpine and Tibetan) (Biome5), Sino-Himalayan Subtropical Forests (Biome8), and Sino-Himalayan Temperate Forests (Biome7). It has an area of c. 59,993 ha, with agricultural land comprising approximately 8,500 ha, 28,943 ha under reserve forests, and 22,550 ha comprising forests under the revenue authorities. The Askot Wildlife Sanctuary has two ranges: Askot and Dharchula. About 15,000 ha of the area in Dharchula range along the international border is under the control of the Indo-Tibetan Border Police and Indian Army.

Thus, less than 50% of the total area is under the control of the Forest Department. The sanctuary was notified in July 1986, and covers three major watersheds: Kali, East Dhauli, and Goriganga.

A large part of the Gori valley (total area 224,000 ha), about 143,900 ha or 64.24% of the entire basin, constitutes village common land that is administered by village forest councils or *van panchayats*. Another 8% is under reserve forests which include portions of such valuable protected areas as the Nandadevi National Park (62,500 ha), the core zone of the Nanda Devi Biosphere Reserve, a World Heritage Site, and the Askot Wildlife Sanctuary. About 34,700 ha in the Gori basin, that is classified as Civil *benaap*, falls under



ASAD R. RAHMANI

Askot Wildlife Sanctuary covers three watersheds: Kali, East Dhaul, and Goriganga

the Askot Wildlife Sanctuary. In all, these village commons, reserve forests, and civil and *soyam* (revenue) land under the sanctuary area, make almost 88% of the Goriganga basin protected areas, both by village communities, as well as by the State.

In about 100 km from its source at Milam glacier to its confluence with River Kali, the Goriganga passes through Sub-Tropical Sal forests to Dry Alpine meadows with Trans-Himalayan characteristics. Thus exceptional diversity of flora and fauna are encountered in the basin in a short geographical distance.

Two of the important areas surrounding Askot WLS are the Kalamuni ridge, and the Athansi, Madkani, and Golpha blocks of North Pithoragarh Division. Brief descriptions of these are given below:

Athansi, Madkani and Golpha blocks of Pithoragarh Forest Division

Athansi, Madkani, and Golpha reserve forest blocks have an area of 1,832 ha, 1,287 ha, and 1,365 ha respectively. These are situated north of Munsyari in Pithoragarh on the slopes of the Panchachuli massif, which rises to c. 7000 m. The Athansi block is located close to the catchment of Ralam Gad (a left bank tributary of Goriganga) while Madkani and Golpha are located east of Athansi block. The three areas are linked by an intermediate alpine zone, which has the administrative status of civil forests.

The three forest blocks mentioned above have a range of vegetation communities from Ban Oak *Quercus leucotrichophora* forest to alpine vegetation. Golpha block has a rare vegetation community: Himalayan Hemlock *Tsuga dumosa* forests. This community is also found in the Askot Sanctuary.

The subalpine forests of Athansi block have been

rated as the second ranking area, and those in the Madkani block as the fourth ranking area in the timber line zone of Uttaranchal hills on the basis of botanical criteria like richness, representativeness, naturalness, uniqueness, and endemism (Dhar *et al.* 1997).

The area has special conservation value, being the easternmost protected area in the Western Himalaya in India, and it represents the western limits of many eastern floral communities such as *Tsuga* and *Macaranga*.

Kalamuni ridge in Pithoragarh Forest Division

Kalamuni ridge is a large area of moist temperate and alpine forests. It is known to harbour the Satyr Tragopan *Tragopan*

satyra, White-throated Tit *Aegithalos niveogularis*, and abundant populations of Himalayan Monal *Lophophorus impejanus*. The forests of Kalamuni ridge are rich in floral and faunal elements. Khulia area has large patches of Birch-Rhododendron forests, due to which the area was proposed as a sanctuary.

Due to the great altitudinal variation and representation of nearly all major West Himalayan forest types, from Sal forests to alpine (sometimes on a single slope, e.g., Chiplakot ridge) there is an abundant representation of Himalayan avifauna and other faunal elements. This, combined with high contiguity of forest cover, makes Askot one of the most important bird areas of India.

AVIFAUNA

A consolidated list of the observations of Sultana & Khan (2000), Foundation for Ecological Security (2002), and Rashid Raza of the Wildlife Institute of India (*pers. comm.* 2003), gives a total of 227 (212 breeding, forest dependent) bird species from 30 families and 118 genera, representing more than 45% of the breeding bird diversity of the Western Himalaya, and nearly 55% of the breeding bird species of the Kumaon Himalaya. This is a remarkable representation of Himalayan avifaunal diversity. The lower altitude areas are still under-explored, and the list would be much longer if areas below 1,500 m were properly surveyed.

This assemblage represents two out of 11 West Himalayan restricted-range species (Stattersfield *et al.* 1998), including the globally Threatened Cheer Pheasant *Catreus wallichii*. Overall, this IBA site has 17 species that are rare or uncommon in the Himalaya.

The area also has biome species, with 81 species representing Biomes 5, 7, and 8, constituting 6.6%, 23.5%, and 8%, respectively, of the total breeding birds. These

VULNERABLE

Cheer Pheasant *Catreus wallichi*

NEAR THREATENED

Satyr Tragopan *Tragopan satyra*

ENDEMIC BIRD AREAS 128: WESTERN HIMALAYA

Cheer Pheasant *Catreus wallichi*

White-throated Tit *Aegithalos niveogularis*

species represent 71% of all biome-restricted species recorded in Kumaon.

OTHER KEY FAUNA

The sanctuary harbours the typical fauna of Himalayan forests as well as alpine pastures. Some of the rare and Threatened species found in the Askot Sanctuary are Himalayan Musk Deer *Moschus leucogaster*, Snow Leopard *Panthera uncia*, Himalayan Tahr *Hemitragus jemlahicus*, Bharal or Blue Sheep *Pseudois nayaur*, Himalayan Brown Goral *Nemorhaedus goral*, Himalayan Serow *Capricornis thar*, Asiatic Black Bear *Ursus thibetanus*, and Brown Bear *Ursus arctos*.

LAND USE

- Nature conservation and research
- Forest *panchayats* (village councils) and grazing lands

THREATS AND CONSERVATION ISSUES

- Livestock grazing
- Poaching of birds (killing, trapping)
- Unsustainable exploitation of forest products
- Illegal wildlife trade
- Goriganga Hydro-Electric Project

A large proportion of the land is privately owned. Askot suffers high anthropogenic pressure from the 109 villages in its vicinity, with a population of about 58,967, most of whom are dependent on the sanctuary for fuel, fodder, and other resources.

Grazing also affects the sanctuary, especially in the alpine areas. Approximately 84,000 heads of livestock graze in the sanctuary throughout the year.

Resin is tapped from trees at lower altitudes. Poaching of musk deer and other wildlife occurs at higher altitudes, and there is illegal crossborder trade of medicinal plants, bear bile, and musk.

According to Rashid Raza, a series of dams have been proposed on the Goriganga by NHPC (National Hydropower Corporation). While the construction in the adjacent Darma basin is nearing completion, it is proposed to start work in the Goriganga basin soon. Denotification of

parts of Askot WLS to accommodate the dams is a possibility.

According to the latest information Goriganga Hydro Power proposes to set up a 370 MW Goriganga hydel power unit. The project will be implemented in two phases, Phase I will comprise 146 MW Bogudiyar - Sirkari Bhyol unit and Phase II 225 MW Mapang - Bogudiyar unit. The Goriganga river originates from Milam glacier and flows generally in south to south-east direction, and joins river Sarda, known as river Kali in Uttarakhand. The catchment of the river at the diversion structure of proposed Rupsiabagar-Khasiyabara hydroelectric project is 1120 sq. km. This includes 29 glaciers and permanent ice caps measuring 346 sq. km. The seasonal snow covered area in the catchment is about 640 sq. The status of the EIA report conducted by NTPC is of such low quality that only eight bird species, ten species of mammals and five species of reptiles are mentioned (Anon. 2007, page 238).

Research initiatives in Askot have begun only recently, with the GB Pant Institute of Himalayan Environment and Development initiating studies from 1995 onwards. There are also records from the Panchuli multidimensional expedition in 1998. In 2002, the Wildlife Institute of India initiated a study on plant and bird diversity and rarity patterns along the elevation gradient.

The Foundation for Ecological Security (an NGO based in Munsiriya) is involved in detailed documentation of the biodiversity values in the area. The NGO is also involved in grassroots level conservation initiatives and community afforestation programmes.

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Rashid H.Raza, Dhananjai Mohan, S. Sathyakumar, G.S. Rawat, Rajah Jayapal.

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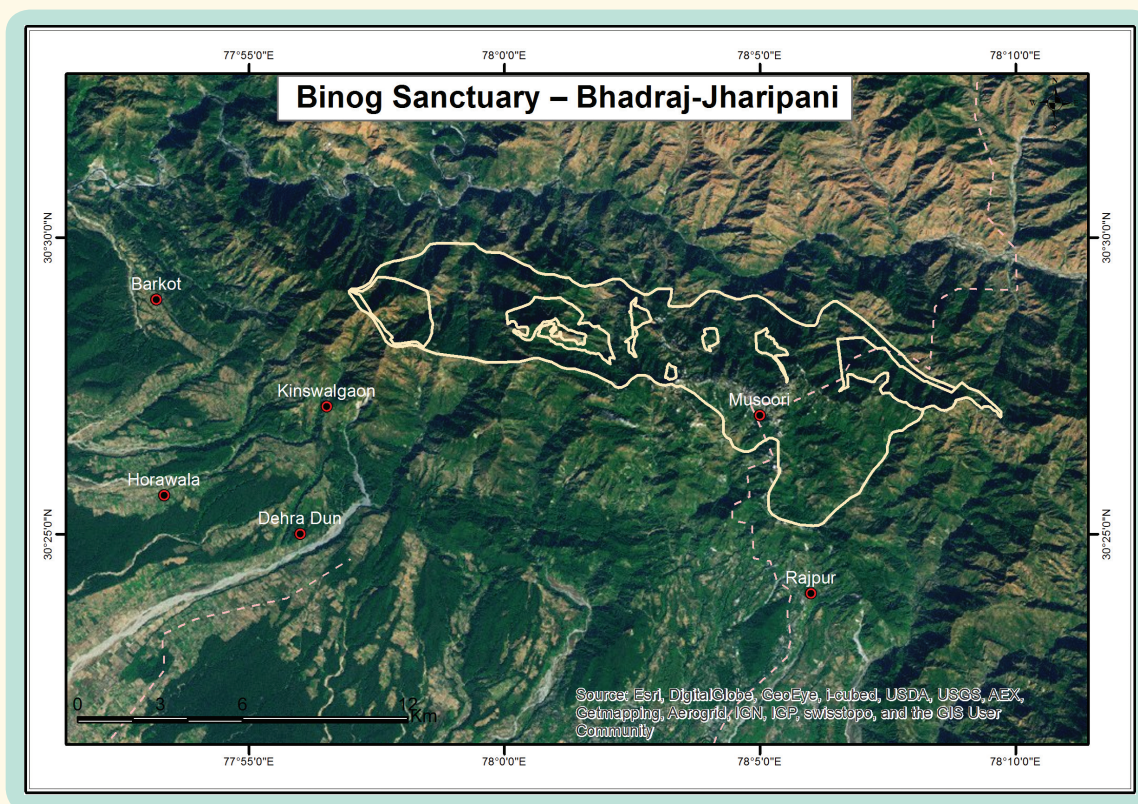
BINOG SANCTUARY AND BHADRAJ-JARIPANI

IN-UT-03

IBA Site Code	: IN-UT-03	Altitude	: 1,500–2,200 msl
State	: Uttarakhand	Rainfall	: 1,500 mm
District	: Dehra Dun	Temperature	: 0 °C to 25 °C
Area	: 2,000 ha (sanctuary area=1082 ha)	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Himalayan Moist Temperate Forest, Himalayan Sub-Tropical Forest
Coordinates	: 30° 27' 52" N, 78° 04' 17" E		

IBA CRITERIA : A1 (Threatened species), A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS: Wildlife Sanctuary, established in September 1993.



GENERAL DESCRIPTION

This IBA is located west and south of Mussoorie, a popular hill station in north India. Mussoorie Sanctuary was notified in 1993 and included areas west of Mussoorie up to Bhadraj, the last peak in the Mussoorie range. Initially covering 1,082 ha, the sanctuary was called Mussoorie Sanctuary. Twenty years later, the final notification remains to be issued. Jharipani is a sub-tropical area between Mussoorie and Dehra Dun, and a specimen of Mountain Quail or Himalayan Quail *Ophrysia superciliosa* has been obtained here in the past.

The sanctuary was created to preserve a small patch of oak forest very close to Mussoorie, which is considered as Mountain Quail habitat. The bird is still classified

as Critically Endangered (probably not extinct), as the possibility of its existence in the area cannot be ruled out (BirdLife International, 2001).

The main forest of the area is Himalayan Moist Temperate (Ban Oak) type. The lower parts of the site are covered with subtropical pine forests. Substantial areas have grass and scrub cover.

The sanctuary forms much of the catchment area of Kempty falls, a major tourist attraction of Mussoorie, and its forests play a crucial role in maintaining a good water flow in the lean summer months (Goyal 1999). The state-owned area is covered with forests. There are a few large private estates with large tracts of forest adjoining the Mussoorie

Sanctuary and these are equally good bird habitats.

Binog-Mussorie Sanctuary IBA should be expanded to include Suwakholi/Dhanaulti, which may be suitable habitat for the Himalayan Quail, too. Also, the adjoining Aglar (Magra/Deolsari) needs to be considered as part of this IBA, and the Raipur-Sahastradhara area below Jharipani and Dhanaulti, which is one of the 5 or 6 known locations in India for the Grey-crowned Prinia *Prinia cinereocapilla* (multiple sightings here) (Sanjay Sondhi, *in litt.* 2014)

AVIFAUNA

Detailed studies on the birdlife of this IBA have not been done, but common birds of temperate Ban Oak forests can be seen. The area is best known for the occurrence of Mountain Quail in the past (Ali & Ripley 1987, Grimmett *et al.* 1999, BirdLife International 2001, Shafique & Javed 1999). Nearly a dozen specimens of Mountain Quail were collected between 1836 and 1876 from Mussorie and Nanital areas (Rieger & Walzthony 1992). According to Rasmussen and Anderton (2005) only nine specimens are traceable. After its description from live specimens in 1846, wild birds were seen but not collected until 1865 when Kenneth Mackinnon shot a pair in November between Budraj and Benog. Two years later, again in November, five specimens were obtained near Jharipani, above Dehra Dun at about 1,650 msl. All attempts to locate it in recent times have been unsuccessful (Rahmani 2012). Cheer Pheasant *Catreus wallichi* and Kaleej Pheasant *Lophophorus leucomelanos* are found in this area (S. Sathyakumar, *pers. comm.* 2003).

CRITICALLY ENDANGERED

Himalayan Quail	<i>Ophrysia superciliosa</i>
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VULNERABLE

Cheer Pheasant	<i>Catreus wallichi</i>
Grey-crowned Prinia	<i>Prinia cinereocapilla</i>

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Cheer Pheasant	<i>Catreus wallichi</i>
Himalayan Quail	<i>Ophrysia superciliosa</i>

OTHER KEY FAUNA

Himalayan Brown Goral *Nemorhaedus goral*, Barking Deer *Muntiacus muntjak* and Leopard *Panthera pardus* are still found, despite many years of hunting. Himalayan Serow *Capricornis thar* was shot many decades ago, west of Binog (Dang 1968).

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Tourism
- Grazing
- Road building

The highest priority is to ensure the final notification of the wildlife sanctuary, so there is no ambiguity as to its protected status. As the area is very close to Mussoorie, a major tourist spot, an interpretation centre should be



FAZLUR RAHMAN

This IBA was mainly created as supposedly extinct Mountain Quail *Ophrysia superciliosa* was found here. The main forest of the Sanctuary is Himalayan Moist Temperate (Ban Oak) type, with grassy slopes



KALYAN SINGH SAIWAN

A small population of Cheer Pheasant *Catreus wallichi* is still found in this IBA. Its main habitat is slightly grazed grassy hill slopes

considered, with a major focus on the Himalayan Quail and other Himalayan fauna. Himalayan Quail is likely to be present in these areas, where it was reported 100 years back, though it is now considered to be extinct. The interpretation centre could become a good place for disseminating conservation education.

There should be intensive efforts to rediscover the Himalayan Quail. This could include a poster campaign with the involvement of local people. Habitat management in the sanctuary should also be guided by the habitat requirements of this species.

The forests in the area are fragmented and there are villages in the vicinity, which depend on them. However, the pressures are not severe and inaccessibility because of lack of all-season roads helps in reducing disturbance.

With the increase of tourism pressure in Mussoorie, more and more people have a tendency to look for quieter places in the vicinity. As a result some sites such as Clouds End on the edge of the sanctuary are beginning to attract tourists, which if not controlled would adversely affect the habitat. A proposed road through the area may also damage adjacent forests.

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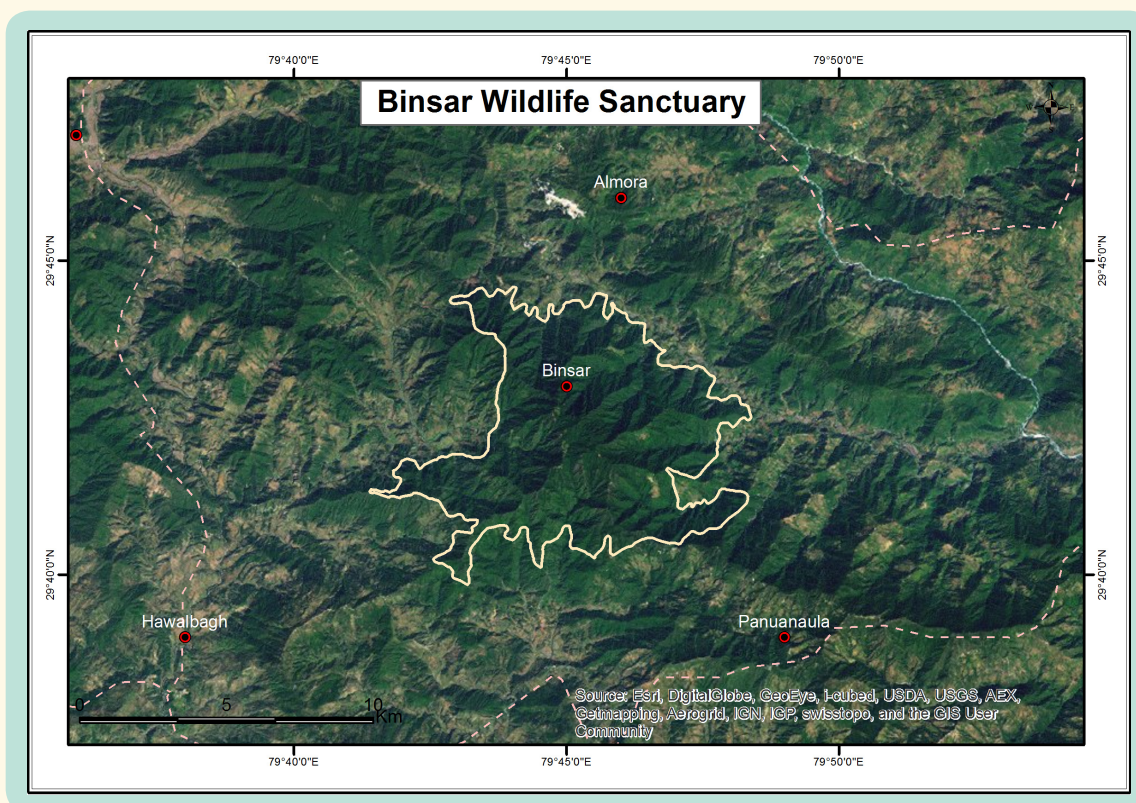
BINSAR WILDLIFE SANCTUARY

IN-UT-04

IBA Site Code	: IN-UT-04	Altitude	: 900–2,450 msl
State	: Uttarakhand	Rainfall	: 1,000 mm
District	: Almora	Temperature	: -2 °C to 25 °C
Area	: 4,559 ha	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Himalayan Moist Temperate Forest, Sub-tropical Pine Forest
Coordinates	: 29° 40' 00" N, 79° 45' 00" E		

IBA CRITERIA : A3 (Biome7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in May 1988.



GENERAL DESCRIPTION

Binsar Wildlife Sanctuary (WLS) is situated about 30 km from Almora district headquarters. It covers an area of c.45 sq. km. There are 32 villages in and around Binsar, which are dependent on forest resources. Also, there are five privately owned estates, of which three are on the periphery of the core zone.

Binsar WLS represents the characteristic floral elements of moist temperate forests, with Oak forests surrounded by Chir Pine and agricultural land (Ilyas 1998). The Oak forest is more diverse than the Pine. A total of 40 species of trees, 32 species of shrubs and ferns, 50 species of herbs, and 19 species of grasses were identified by Ilyas (1998).

AVIFAUNA

About 166 species of birds have been recorded to date from this IBA site (Ilyas 1998). Out of the 112 species listed in Biome7 (BirdLife International, undated), 23 have been identified in Binsar WLS. There are some species of Biome 5 and Biome 8 also, but these are not listed in the table below. This is one of the sites in India that were selected only on the basis of biome-restricted assemblages in Western Himalaya EBA128. Only White-throated Tit *Aegithalos niveogularis* has been recorded by Ilyas (1998), but more restricted-range species are likely to occur (Khan *et al.* 2000).

OTHER KEY FAUNA

Leopard *Panthera pardus* is the major predator of

herbivores such as Barking Deer *Muntiacus muntjak*, Himalayan Brown Goral *Nemorhaedus goral*, and Wild Boar *Sus scrofa*. Golden Jackal *Canis aureus*, Himalayan Yellow-throated Marten *Martes flavigula*, Kashmir Flying Squirrel *Hylopetes fimbriatus* and Black-naped Hare *Lepus nigricollis* are also found. Rhesus Macaque *Macaca mulatta* and Himalayan Langur *Semnopithecus schistaceus* are the non-human primates of Binsar.

Two species of butterflies, Great Satyr *Aulocera padama* (Satyridae) and the Mixed Punch *Dodona ouida* (Erycinidae), both of which feed on grasses, have been recorded. These have not been reported from any other region of the Kumaon Himalaya.

LAND USE

- Nature conservation

THREATS AND CONSERVATION ISSUES

- Firewood collection
- Poaching
- Tourism and recreation

Some 32 villages under the administrative purview of Bageshwar and Almora subdivisions are located in and around Binsar Wildlife Sanctuary and are directly or indirectly dependent on its natural resources. They were the target villages under the Government 'Eco-Development project' launched by the State Forest Department in 1992. In order to minimize dependence on fuel wood gathered from the sanctuary, the Forest Department distributed solar generators, pressure cookers and smokeless *chulhas* (= stoves) to poor villagers, but the plan failed as maintenance costs were too high.

Collection of medicinal plants from this IBA is one of the threats to biodiversity. The villagers use 50 plant species as medicine (Ilyas 1998). Neither is it desirable nor possible to ban this collection, so it is better to coordinate it in such a way that it is sustainable for both the sanctuary and for the villagers.

As the Sanctuary is situated very close to an important

BIOME7: SINO-HIMALAYAN TEMPERATE FOREST

Common Hill-Partridge	<i>Arborophila torqueola</i>
Koklass Pheasant	<i>Pucrasia macrolopha</i>
Himalayan Pied Woodpecker	<i>Dendrocopos himalayensis</i>
Nepal House-Martin	<i>Delichon nipalensis</i>
Rufous-breasted Accentor	<i>Prunella strophilata</i>
Greater Long-billed Thrush	<i>Zoothera monticola</i>
White-throated Laughingthrush	<i>Garrulax albogularis</i>
Striated Laughingthrush	<i>Garrulax striatus</i>
Streaked Laughingthrush	<i>Garrulax lineatus</i>
Orange-barred Leaf-warbler	<i>Phylloscopus pulcher</i>
Grey-faced Leaf-warbler	<i>Phylloscopus maculipennis</i>
Large-billed Leaf-warbler	<i>Phylloscopus magnirostris</i>
Rusty-tailed Flycatcher	<i>Muscicapa ruficauda</i>
Fire-capped Tit	<i>Cephalopyrus flammiceps</i>
Simla Crested Tit	<i>Parus rufonuchalis</i>
Spot-winged Crested Tit	<i>Parus melanolophus</i>
Green-backed Tit	<i>Parus monticolus</i>
White-tailed Nuthatch	<i>Sitta himalayensis</i>
Bar-tailed Treecreeper	<i>Certhia himalayana</i>
Yellow-breasted Greenfinch	<i>Carduelis spinoides</i>
Pink-browed Rosefinch	<i>Carpodacus rhodochrous</i>
Vinaceous Rosefinch	<i>Carpodacus vinaceus</i>
Brown Bullfinch	<i>Pyrrhula nipalensis</i>

tourism circuit, there is potential to develop an Interpretation Centre. This site is ideal for disseminating conservation education.

KEY CONTRIBUTOR

Orus Ilyas.

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CORBETT TIGER RESERVE

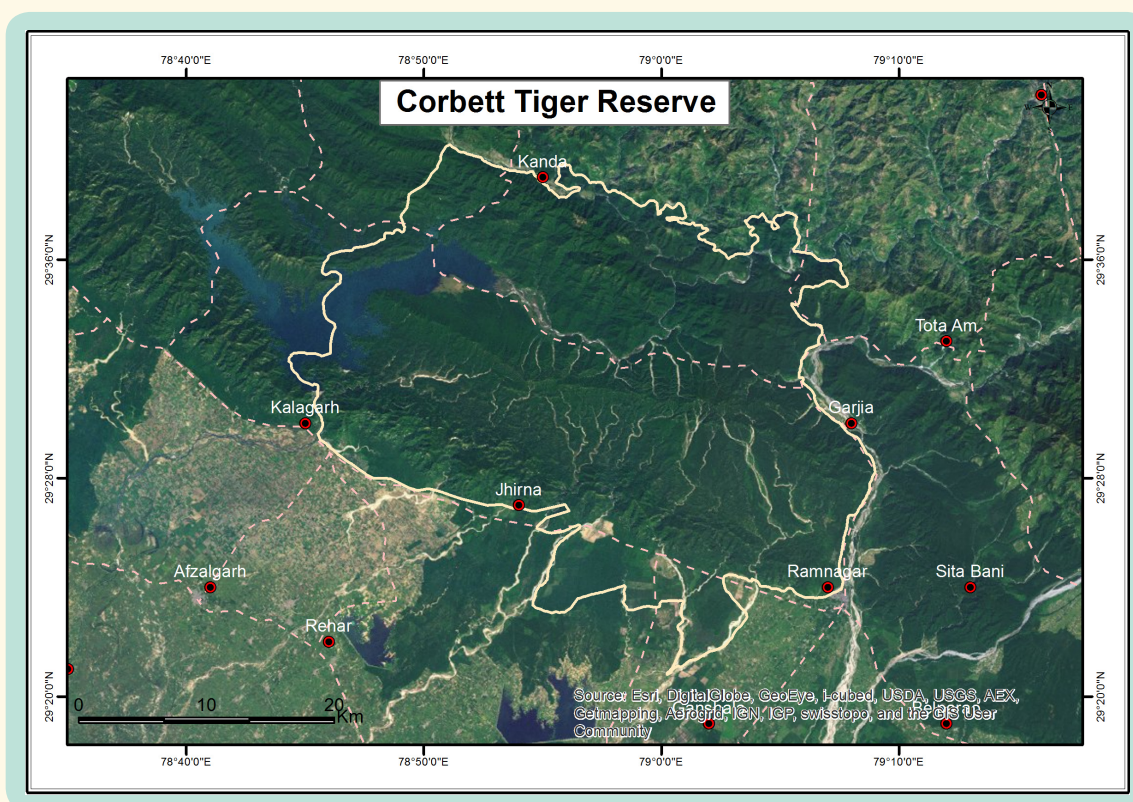
IN-UT-05

IBA Site Code	: IN-UT-05
State	: Uttarakhand
District	: Pauri Garhwal, and Nainital
Area	: 128,800 ha
Ownership	: State
Coordinates	: 29° 35' 23" N, 78° 54' 57" E
Altitude	: 400–1,210 msl

Rainfall	: 1,400 mm
Temperature	: 2 °C to 47 °C
Biogeographic Zone	: Himalaya
Habitats	: Sub-alpine Forest, Tropical Dry Deciduous Forest, Tropical Moist Deciduous Forest, Tropical Grassland, Reservoir

IBA CRITERIA : A1 (Threatened species)

PROTECTION STATUS: Tiger Reserve, established in 1973. Includes Corbett National Park and Sonanadi Wildlife Sanctuary.



GENERAL DESCRIPTION

Corbett Tiger Reserve is situated in the hilly districts of Pauri Garhwal and Nainital in the northern state of Uttarakhand. It is one of the nine Tiger Reserves created at the launch of Project Tiger in 1973. This reserve includes Corbett National Park, which was the first national park to be established in India. It was declared in 1936 as Hailey NP with an area of 32,375 ha, to which 19,707 ha were added later as Ramganga NP, and finally the whole area named Corbett NP in 1957, in memory of the legendary hunter turned conservationist Jim Corbett. In 1991, 79,772 ha was added as a buffer area to the tiger reserve, making the total area of the reserve 131,854 ha (Jain 2001). After the bifurcation of the state of Uttar Pradesh in November

2000, a small part of the reserve remained in Uttar Pradesh, reducing the area of the reserve marginally to 128,800 ha. This is one of the most famous Tiger Reserves in India and is extremely popular with tourists for its history, scenic beauty, and the wildlife. Sonanadi Wildlife Sanctuary, a part of Corbett Tiger Reserve, is considered as a separate IBA for administrative reasons.

Corbett Tiger Reserve is situated in the South Patlidun area of the Himalayan foothills, and ranges in altitude from 400 m to 1,210 m. Corbett TR includes the foothills of the Outer Himalaya in the north and the Shivaliks in the south. The Outer Himalaya which forms the northern boundary contains Kanda, the highest point, with its magnificent panoramic view of the reserve. The Ramganga

DHRTIMAN MUKHERJEE



Corbett NP is world famous for its large herds of Asiatic Elephant *Elaphus maximus*, Tiger *Panthera tigris* and deer species but not many people know that up to 550 species of birds are found in this vast sprawling Park and Tiger Reserve

valley, the largest in the Reserve, with its long axis from east to west, lies between the Outer Himalaya and the Shivaliks. Through Ramganga valley, three thickly forested ridge systems run roughly parallel to each other. Offshoots of these ridges run north to south, and the small valleys formed in between are known as *sots*. Many smaller valleys run from the Shivaliks towards the south and the prominent one is Paterpani *sot*.

Different types of vegetation are found all along the varied topography, which comprises hilly and riverine areas, temporary marshy depressions, plateaux, and ravines. Up to 110 species of trees, 51 species of shrubs, and more than 33 species of bamboo and grass are found here. Corbett is known for its almost pure stands of Sal *Shorea robusta* in the lower hilly ridges and flat valleys.

The *chaurs*, or savanna grasslands, are covered with a variety of tall grasses such as *Themeda arundinacea*, *Vetiveria zizanioides*, *Cymbopogon jwarancusa*, and *Desmostachya bipinnata*. Encroachment by *Cannabis sativa* on these grasslands, which are vital for species such as Hog Deer *Axis porcinus*, is a cause for concern. Controlled burning is carried out during winter to prevent woodland encroachment and to promote the growth of fresh grass.

AVIFAUNA

Corbett has many attractions for birdwatchers. Nearly 550 species of birds are reported (Sharma *et al.* 2003, other communications). Of the 69 species of diurnal raptors

reported from the Indian subcontinent, 51 are found in Corbett (Naoroji 1999); and of the 26 species of woodpeckers, 15 are reported from Corbett (Grewal & Sahgal, 1995). Although Corbett does not have many restricted-range species, it has 15 species of Biome 8 (Sino-Himalayan Subtropical Forest). Species from Biome 5 (Eurasian High Montane – Alpine and Tibetan) and Biome 7 (Sino-Himalayan Temperate Forest) are also found here. Among the interesting species is Ibisbill *Ibidorhyncha struthersii*, a denizen of cold streams and shingle beds of the Himalaya. Brown Dipper *Cinclus pallasii* is also frequently seen in winter. Among Near Threatened species, 13 are found in this site.

Vultures are still seen but in diminishing numbers. It is still the best place to see Critically Endangered Red-headed Vulture *Aegypius calvus* and Slender-billed Vulture *Gyps tenuirostris*. The vast number of White-backed Vulture *Gyps bengalensis* seen before 1990s have all but gone.

Fortunately, Corbett TR is still one of the best places in India to see Pallas's Fish-eagle *Haliaeetus leucoryphus* (Naoroji 2007). At least five pairs breed along a 30 km stretch of the Ramganga river.

A neglected species that is now considered Vulnerable by BirdLife International (2001) is the Grey-crowned Prinia, *Prinia cinereocapilla*, earlier known as Hodgson's Prinia. It appears in the checklist of birds of Corbett NP, but according to Manoj Sharma (*in litt.* 2010), it is found close to Pungot at c. 1600 msl, not inside the Park.

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
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VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Sarus Crane	<i>Grus antigone</i>
Wood Snipe	<i>Gallinago nemoricola</i>
Grey-crowned Prinia	<i>Prinia cinereocapilla</i>

NEAR THREATENED

Spot-billed Pelican	<i>Pelecanus philippensis</i>
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Pallid Harrier	<i>Circus macrourus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
River Lapwing	<i>Venellus duvaucelii</i>
Great Thick-knee	<i>Esacus recurvirostris</i>

OTHER KEY FAUNA

Approximately 50 species of mammals are found in this reserve. Among the larger mammals, Tiger *Panthera tigris*, Leopard *P. pardus*, Asiatic Elephant *Elephas maximus*, Sambar *Rusa unicolor*, Cheetal *Axis axis*, Hog Deer *Axis porcinus*, Barking Deer or Indian Muntjak *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Himalayan Brown Goral *Naemorhedus goral*, and Golden Jackal *Canis aureus* are noteworthy. Himalayan Serow *Capricornis thar* is occasionally seen in Kanda ridge. Interestingly, in winter the Asiatic Black Bear *Ursus thibetanus* visits the northern part of the reserve and Sloth Bear *Melursus ursinus* is resident in the southern portion. Among the reptiles, the two largest Indian species, Gharial *Gavialis gangeticus* and Marsh Crocodile *Crocodylus palustris*, are found here. In addition to numerous amphibians and lizards, the largest of the poisonous snakes, King Cobra *Ophiophagus hannah*, and Indian Rock Python *Python molurus* are frequently seen. Some of the best game fish of India, such as Golden Mahseer *Tor putitora* and Indian Trout *Barilius bola* abound in the waters of Ramganga streams which flow through the reserve.

LAND USE

- Nature conservation and research
- Tourism and recreation



DHIRTIMAN MUKHERJEE

Most of the Corbett NP is situated in the Himalayan foothills with Tropical Dry Deciduous and Tropical Moist Deciduous forests, and grassland. Along with Sonanadi Wildlife Sanctuary and newly created Nandhour Wildlife Sanctuary and reserve forests, Corbett forms a large landscape of protected forests

THREATS AND CONSERVATION ISSUES

- Livestock grazing on fringes
- Poaching and wildlife trade
- Invasive species
- Forest fires
- Man-animal conflict
- Tourism
- Disturbance from Kalagarh township

Recurrent forest fires are a common feature of Corbett Tiger Reserve. During summer, the forest floor is covered with highly combustible dry leaf litter, largely contributed by Sal leaves. The slightest ignition initiates widespread forest fires which are difficult to control. Fire lines are kept clear of debris to serve as fire breaks. Fire ecology studies to assess the impact of fire on wildlife populations are required to be done in this IBA.

On an experimental basis, *Lantana camara* has been successfully eradicated in Sarpduli range by uprooting *Lantana* and planting *Arundo donax*, a tall grass species. This management practice should be extended to many other sites in Corbett NP.

An eco-development programme has been initiated along the forest boundary to involve local villagers in biodiversity conservation and to reduce man-animal conflicts. The Hindi edition of *Corbett Newsletter* is distributed to keep the villagers informed of policy decisions and the management programme. *Ex gratia* relief is offered to villagers for accidental human deaths by wild animals, livestock kills, and damage to crops by wild elephants. Eco-development committees are being formed in villages to enable communities to plan and implement programmes for conservation of resources and alternative forms of livelihood. It is desirable that the wildlife resorts along the Kosi river, which prosper because they are close to Corbett Tiger Reserve, should significantly contribute to the reserve by supporting programmes such as control of poaching and weed eradication.

The construction of a reservoir on the Ramganga river, and the building of the Kalagarh township on the southwestern boundary of Corbett Tiger Reserve in the early 1970s, have curtailed the movement of elephants and tigers across the Ramganga river, south of the reservoir, from Corbett NP to Kalagarh FD (Sona Nadi WLS). Occasionally, tigers and bull elephants come down from the reserve along the *Sukha sot*, which is situated to the east of the Kalagarh–Saddle Dam road, to the Ramganga river and cross over to Kalagarh FD. The Kalagarh project and township was built on 9,000

ha of forest land, and according to an agreement between the Irrigation and Forest Departments, 350 ha of this area should have been vacated and returned to the Forest Department soon after the completion of the reservoir. After much persuasion, 310 ha were returned by the Irrigation Department. The remaining area (40 ha) has colonies of about 4,000–5,000 people. The Forest Department, supported by NGOs, has now filed cases against 724 individuals to evict them and their families, and the case is in the court of the Sub-Divisional Magistrate, Kotdwar. The encroachers in Kalagarh colony should be evicted, which will be possible only when the Government of India, the Government of Uttarakhand, and NGOs interested in the conservation of Corbett Tiger Reserve work together. The *Sukha sot* area also needs total protection from disturbances such as wood cutting by the inhabitants of Bikkhawala village (population about 1,200).

Corbett National Park forms the core area of the Corbett Tiger Reserve (128,800 ha) which also includes the Sona Nadi Wildlife Sanctuary (30,200 ha) to the west of the Reserve. There are recommendations from conservationists to enlarge the tiger reserve to about 200,000 ha which could be called Greater Corbett Tiger Reserve and which would encompass the areas between Khoh river (near Kotdwar) and Boar river (near Kaladhungi). If this expansion is undertaken, this protected area will remain the most compact and vital area in the Himalayan foothills for the conservation of several endangered species of birds and mammals.

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A.J.T. Johnsingh, Rishad Naoroji, Dhananjai Mohan.

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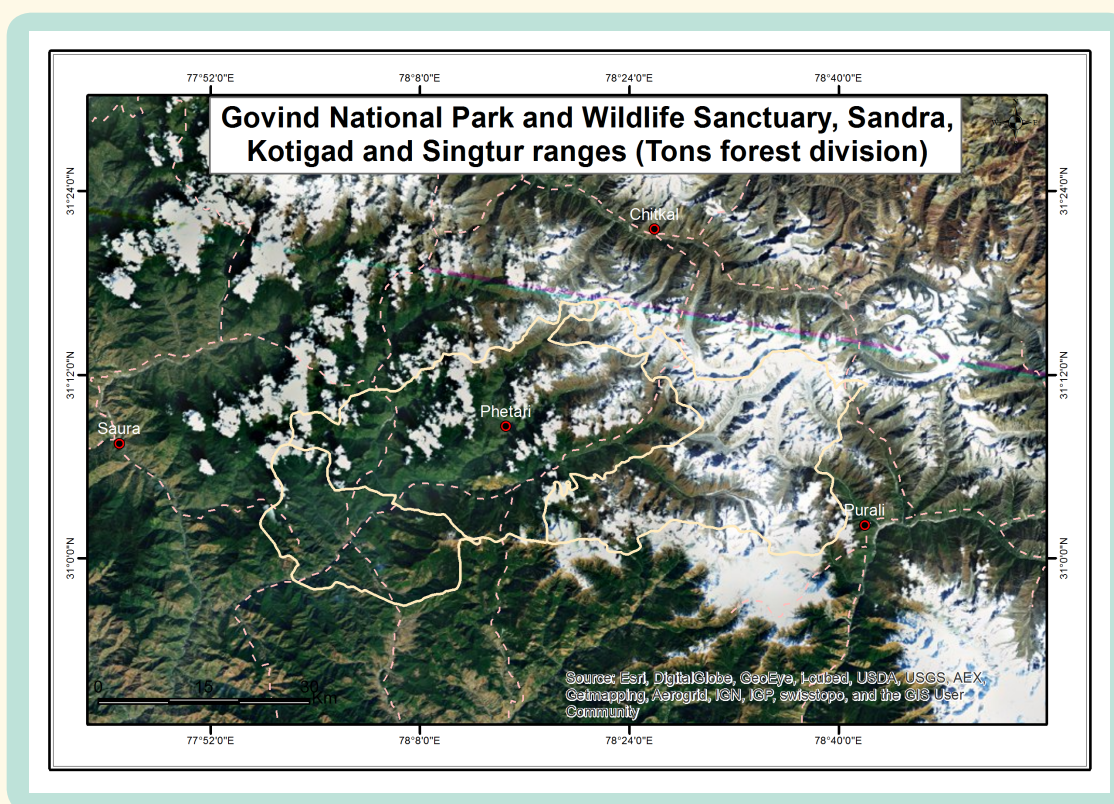
GOVIND NATIONAL PARK AND WILDLIFE SANCTUARY, SANDRA, KOTIGAD AND SINGTUR RANGES (TONS FOREST DIVISION)

IN-UT-06

IBA Site Code	: IN-UT-06	Altitude	: 1,290–6,387 msl
State	: Uttarakhand	Rainfall	: 1,500 mm
District	: Uttarkashi	Temperature	: 0 °C to 25 °C
Coordinates	: 31° 09' 44" N, 78° 19' 46" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Himalayan Moist Temperate Forest, Sub-tropical Pine Forest, Alpine Moist Pasture
Area	: Govind NP 55,888 ha; Govind WLS and Tons FD area 48,105 ha		

IBA CRITERIA : A1 (Threatened species) A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS: National Park, established in February 1990.



GENERAL DESCRIPTION

Govind National Park (GNP) lies in Uttarkashi district, c. 225 km north of Dehra Dun, the state capital, and comprises the whole of the erstwhile Rupin and Supin Ranges in Tons Forest Division. It is bound to the north by the interstate boundary with Himachal Pradesh, to the east by a chain of mountain peaks and to the south by the Tons-Yamuna watershed. Two major rivers Rupin and Supin flow through the sanctuary, and meet at Naitwar to form the Tons river. Govind Wildlife Sanctuary (GWS) and National Park together cover an area of lush forests, breathtaking scenery, and high faunal diversity.

The national park (55,888 ha) and sanctuary (48,105 ha) together spread over an area of 103,993 ha, forming the upper catchment of the Tons river that is the most important tributary of the Yamuna in its upper reaches. The adjacent Kulni and Balcha Reserved Forests have good temperate vegetation and are notable for Deodar *Cedrus deodara*. These reserve forests have suitable habitat for the Vulnerable Western Tragopan *Tragopan melanocephalus* (Prasad 1993).

Sandra, Kotigad, and Singtur Ranges are contiguous with Govind Wildlife Sanctuary (GWS). Sandra and Kotigad Ranges are located to the west of the GWS, north of the Tons

VULNERABLE

Western Tragopan	<i>Tragopan melanocephalus</i>
Cheer Pheasant	<i>Catreus wallichi</i>

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Western Tragopan	<i>Tragopan melanocephalus</i>
Cheer Pheasant	<i>Catreus wallichi</i>
White-throated Tit	<i>Aegithalos niveogularis</i>

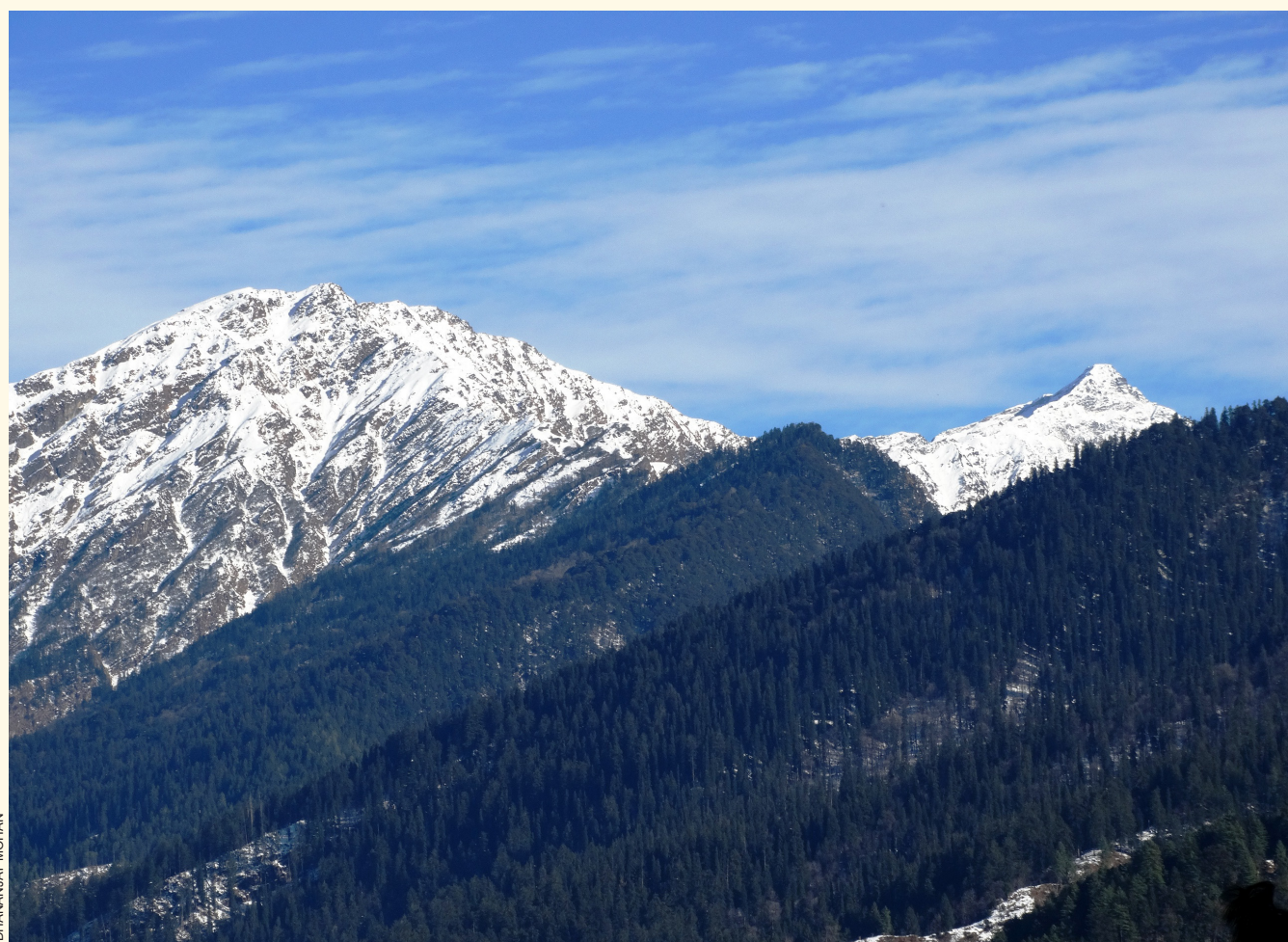
river. Kotigad joins the protected area at a high altitude ridge called the Changshil Dhar, which also demarcates the interstate border of Uttarakhand and Himachal Pradesh. Sandra Range lies between Kotigad Range and the Tons, with its eastern boundary touching GWS. The Taramandal and Cheenwa blocks of Kotigad Range and the Kulni and Balcha blocks of Sandra Range are of special value for biodiversity conservation, as they bear temperate mixed, subalpine, and alpine vegetation. The rest of these ranges are covered primarily with sub-tropical Chir Pine forests. Singtur Range borders GWS on the west and south of Tons river. The forests of this range, which have great importance for biodiversity conservation, are the upper temperate forests of Kedarkanta, an important peak on the southwestern boundary of the GWS.

The Taramandal block of Kotigad Range is supposed to have a small population of Bharal *Pseudois nayaur* (Samant 1995), which could be its southernmost population with respect to the Himalayan axis.

The forests in the IBA are dominated by Chir Pine *Pinus roxburghii*, Cedar *Cedrus deodara*, Oak *Quercus* spp., and other broadleaf species up to c. 2,600 m, above which Blue Pine *Pinus wallichiana*, Cedar, Silver Fir *Abies pindrow*, Spruce *Picea smithiana*, Yew *Taxus baccata*, and other species such as Oak *Quercus* spp., Maple *Acer* spp., Walnut *Juglans regia*, Hazel *Corylus jacquemontii* and Rhododendron *Rhododendron* sp. are predominant (Anon. 1986).

AVIFAUNA

Rashid Raza (*pers. comm.* 2003) of the Wildlife Institute of India has identified 102 species of birds based on preliminary investigation. Judging by the altitude and habitat type, there could be more than 200 species. Among birds, Cheer Pheasant *Catreus wallichi* and Western Tragopan *Tragopan melanocephalus*, globally Threatened species are found here (Bland 1987). The site harbours representative species of Sino-Himalayan Temperate Forest (Biome 7) and



DHANANJAY MOHAN

Govind National Park and Wildlife Sanctuary form the upper catchment of the Tons river that is the most important tributary of the Yamuna in its upper reaches. Judging by the altitude and habitat type, there could be 200 species of birds

Eurasian High Montane – Alpine Forest (Biome 5). In the most recent study from 2009 to 2011 (Abesh Sanyal, Manish Bhardwaj, & V.P. Uniyal, *unpubl.*), 252 bird species were recorded from the area.

Sathyakumar (*in press*) conducted surveys for large mammals and galliforms in 1992 in Govind Pashu Vihar (GNP) and reported six species of galliforms: Kaleej *Lophura leucomelanos*, Himalayan Monal *Lophophorus impejanus*, Koklass Pheasant *Pucrasia macrolopha*, Chukor *Alectoris chukar*, Black Francolin *Francolinus francolinus*, and Common Hill-partridge *Arborophila torqueola*. Encounter rates (number/km) for Himalayan Monal ranged from 0.14 to 0.92, for Koklass 0.4, and for Kaleej 1.6.

OTHER KEY FAUNA

The large mammal fauna is diverse and includes Asiatic Black Bear *Ursus thibetanus*, Brown Bear *Ursus arctos*, Leopard *Panthera pardus*, Snow Leopard *Panthera uncia*, Himalayan Musk Deer *Moschus leucogaster*, Barking Deer or Indian Muntjak *Muntiacus muntjak*, Sambar *Rusa unicolor*, Himalayan BROWN Goral *Naemorhedus goral*, Himalayan Serow *Capricornis thar*, Himalayan Tahr *Hemitragus jemlahicus*, and Blue Sheep *Pseudois nayaur*, as well as Wild Boar *Sus scrofa* (Anon. 1986, Fox *et al.* 1986).

LAND USE

- Nature conservation and research
- Mountaineering, trekking

THREATS AND CONSERVATION ISSUES

- Hunting
- Grazing
- Unsustainable collection of minor forest products

There is considerable potential for extending the sanctuary eastwards, which would enhance its conservation value, especially if its management is integrated with that of the adjacent Chitkul-Raksham Sanctuary in Himachal Pradesh. Kulni and Balcha Reserve Forests could also be included. Prasad (1993) advocated the declaration of a 35,000 ha Western Tragopan Sanctuary in the upper catchment area of Pabar and Rupin rivers. This proposed sanctuary, along with the existing protected area and the adjoining

Rakcham-Chitkul Sanctuary, can be declared as one large conservation unit (Sathyakumar *pers. comm.* 2003).

The forests described have very few permanent human habitations. There are no roads in Sandra and Singtur Ranges, and just one in Kotigad Range (Kotigad-Cheenwa). The villages in lower Kotigad Range have become fairly prosperous owing to apple cultivation, and their dependence on the natural resource base has declined. However, there are summer camps of Gujjars in the upper temperate/sub-alpine zone, though they are also few in number (16 in Kotigad and 4 in Singtur). The alpine pastures of Changshil Dhar are under heavy pressure of grazing from sheep and goats. The interstate boundary is disputed at Changshil Dhar and there is conflict between the two states regarding its utilization by the grazing community.

The Forest Department staff of these areas needs to be sensitized to the biodiversity values of their area. The field staff was largely unaware of the occurrence of Western Tragopan, although there were fairly recent surveys to locate it.

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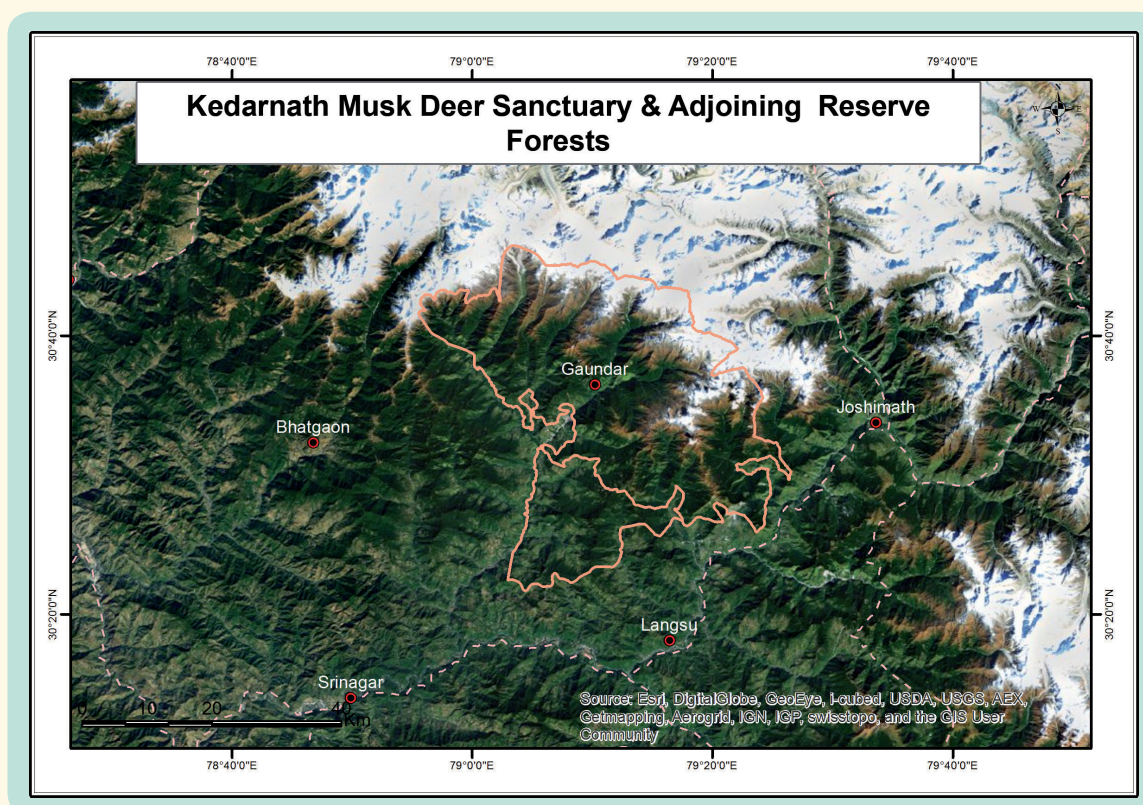
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KEDARNATH MUSK DEER SANCTUARY AND ADJOINING RESERVE FORESTS

IBA Site Code	: IN-UT-07	Altitude	: 1,400–7,068 msl
State	: Uttarakhand	Rainfall	: 3,090 mm
District	: Chamoli	Temperature	: -10 °C to 25 °C
Coordinates	: 30° 42' 46" N, 79° 19' 08" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Montane Wet Temperate Forest, Sub-alpine Forest
Area	: 98,524 ha (97,524 ha + 1,000 ha)		

IBA CRITERIA : A1 (Threatened species), A2 (Endemic Bird Area 128: Western Himalaya), A3 (Biome 7: Sino-Himalayan Temperate Forest; Biome 5: Eurasian High Montane – Alpine and Tibetan; Biome 8: Sino-Himalayan Subtropical Forest)

PROTECTION STATUS: Wildlife Sanctuary, established in January 1972.



GENERAL DESCRIPTION

Kedarnath Wildlife Sanctuary lies in Chamoli district of the Garhwal Himalaya. The sanctuary was created in 1972, and takes its name from the famous Hindu shrine at Kedarnath. It is situated c. 300 km northeast of Delhi, covers an area of 97,500 ha, and is one of the largest protected areas in the Indian Himalaya. The entire sanctuary lies in the southern catchment area of the Alaknanda river, which is one of three major tributaries of the Ganga. The high rainfall in the area has led to lush broadleaf-dominated forests in the temperate and subalpine zones. The Sanctuary also has some eastern Himalayan elements. The highly threatened

Himalayan Musk Deer *Moschus leucogaster* is still found in the sanctuary in good numbers. Mountain peaks border the sanctuary, towering above 6,000 m in the north and the Mandal-Okhimath road to the south. Altitude ranges from 1,400 m (near Phata) to 7,068 m (Chaukhamba peak).

Trishula Reserve Forest adjoins the sanctuary on the Gopeshwar-Mandal side, and is a well-preserved Temperate Deciduous forest.

The subtropical zone is represented mainly by mixed broadleaf forests and patches of Chir Pine *Pinus roxburghii*, up to 2,000 m. Some patches of *Euphorbia royleana* occasionally occur on the dry southern aspects up to 1,500

m. Within the temperate zone, Ban Oak *Quercus incana* (1,500–2,100 m), Moru Oak *Q. dilatata* (2,130–2,750 m) and Kharsu Oak *Q. semecarpifolia* (2,500–3,300 m) forest occur with an admixture of maples (*Acer* sp., *Betula* sp., *Machilus* sp.). The flowering plants of Tungnath and Kedarnath are listed by Semwal & Gaur (1981) and Rau (1961).

AVIFAUNA

Green (1986) reported 132 bird species from Kedarnath WLS. Later, Sathyakumar (1994) added 78 more species to the list, and another 30 species were added by Rashid H. Raza (1996–2000), Ramana Athreya, Vidya Athreya, Dhananjai Mohan, and Sanjay Sondhi (unpublished checklist in Management plan) bringing the total to 240 species. Cheer Pheasant *Catreus wallichi*, a globally Threatened species (BirdLife International 2001), is found in this IBA.

The site falls in the Western Himalaya Endemic Bird Area (Stattersfield *et al.* 1998). Owing to its great altitudinal variation from c. 1,400 m to more than 7,000 m, three biomes (Sino-Himalayan Subtropical Forest, Sino-Himalayan Temperate Forest, and Eurasian High Montane – Alpine and Tibetan), described by BirdLife International (undated), are

VULNERABLE

Cheer Pheasant	<i>Catreus wallichi</i>
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ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Cheer Pheasant	<i>Catreus wallichi</i>
White-throated Tit	<i>Aegithalos niveogularis</i>

BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Common Hill-partridge	<i>Arborophila torqueola</i>
Koklass Pheasant	<i>Pucrasia macrolopha</i>
Long-tailed Thrush	<i>Zoothera dixonii</i>
Long-billed Thrush	<i>Zoothera monticola</i>
White-collared Blackbird	<i>Turdus albocinctus</i>
Gould's Shortwing	<i>Brachypteryx stellata</i>
Blue-capped Redstart	<i>Phoenicurus caeruleocephalus</i>
White-throated Laughingthrush	<i>Garrulax albogularis</i>
Striated Laughingthrush	<i>Garrulax striatus</i>
Spotted Laughingthrush	<i>Garrulax ocellatus</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Greater Scaly-breasted Wren-babbler	<i>Pnoepyga albiventer</i>
Bar-throated Minla	<i>Minla strigula</i>
Stripe-throated Yuhina	<i>Yuhina gularis</i>
Grey-sided Bush-warbler	<i>Cettia brunnifrons</i>
Grey-faced Leaf-warbler	<i>Phylloscopus maculipennis</i>
Large-billed Leaf-warbler	<i>Phylloscopus magnirostris</i>
Grey-cheeked Flycatcher-warbler	<i>Seicercus poliogenys</i>
Orange-gorgeted Flycatcher	<i>Ficedula strophilata</i>
Ultramarine Flycatcher	<i>Ficedula superciliaris</i>
Rufous-bellied Crested Tit	<i>Parus rubidiventris</i>
Brown Crested Tit	<i>Parus dichrous</i>
Green-backed Tit	<i>Parus monticolus</i>
White-tailed Nuthatch	<i>Sitta himalayensis</i>
Fire-tailed Sunbird	<i>Aethopyga ignicauda</i>
Dark-breasted Rosefinch	<i>Carpodacus nipalensis</i>
Pink-browed Rosefinch	<i>Carpodacus rodochrous</i>
White-browed Rosefinch	<i>Carpodacus thura</i>
Scarlet Finch	<i>Haematospiza sipahi</i>
Red-headed Bullfinch	<i>Pyrrhula erythrocephala</i>

BIOME-5: EURASIAN HIGH MONTANE – ALPINE AND TIBETAN

Snow Partridge	<i>Lerwa lerwa</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>
Snow Pigeon	<i>Columba leuconota</i>
Rosy Pipit	<i>Anthus roseatus</i>
Alpine Accentor	<i>Prunella collaris</i>
Altai Accentor	<i>Prunella himalayana</i>
Grandala	<i>Grandala coelicolor</i>
Wall Creeper	<i>Tichodroma muraria</i>
Hodgson's Mountain-finch	<i>Leucosticte nemoricola</i>
Red-fronted Rosefinch	<i>Carpodacus puniceus</i>

BIOME 8: SINO-HIMALAYAN SUBTROPICAL FOREST

Rufous-throated Hill-partridge	<i>Arborophila rufogularis</i>
Slaty-headed Parakeet	<i>Psittacula himalayana</i>
Blue-headed Rock-Thrush	<i>Monticola cinclorhynchus</i>
Tickell's Thrush	<i>Turdus unicolor</i>
Grey-winged Blackbird	<i>Turdus boulboul</i>
Rusty-cheeked Scimitar-babbler	<i>Pomatorhinus erythrogenys</i>
Grey-headed Flycatcher-warbler	<i>Seicercus xanthoschistos</i>
Red-headed Tit	<i>Aegithalos concinnus</i>
Maroon Oriole	<i>Oriolus traillii</i>
Grey Treepie	<i>Dendrocitta formosae</i>

found in this IBA. A total of 94 biome-restricted species have been recorded (BirdLife International undated).

In Biome 7 (Sino-Himalayan Temperate Forest), out of the 112 species listed for India, 63 are found in this IBA. Similarly, out of 48 species of Biome 5 (Eurasian High Montane Alpine and Tibetan) 14 are reported. This IBA also touches Biome 8 (Sino-Himalayan Subtropical Forest), in which 96 species are listed and 15 recorded here. Thus the site has great value for conservation of bird assemblages of the Western Himalaya, especially of Biome 7.

OTHER KEY FAUNA

Over 30 mammalian species, excluding bats, have been recorded (Green 1985, Sathyakumar 1994). Most noteworthy is the record of a Snow Leopard *Panthera uncia* in March 1979 (Green 1982). The ungulates of conservation concern are Himalayan Musk Deer *Moschus leucogaster*, Indian Muntjak or Barking Deer *Muntiacus muntjak*, Sambar *Cervus unicolor*, Himalayan Brown Goral *Naemorhedus goral*, Himalayan Serow *Caprinornis thar*, Himalayan Tahr *Hemitragus jemlahicus*, and Blue Sheep *Pseudois nayaur*.

LAND USE

- Tourism and recreation
- Nature conservation and research
- Pilgrim centre

THREATS AND CONSERVATION ISSUES

- Poaching, especially of Musk Deer and Asiatic Black Bear
- Forest fires
- Collection of medicinal plants and other forest produce
- Grazing



DHIRTIMAN MUKHERJEE

Large and sprawling Kedarnath Musk Deer Sanctuary and adjoining areas is one of the largest protected areas in the Western Himalaya

■ Tourism

This wildlife sanctuary, established mainly to protect the Himalayan Musk Deer, is also important for the diversity of its flora and fauna, notably its assemblage of ungulate species unique to the Garhwal Himalaya. It has been proposed to include the adjoining reserve forest in the sanctuary and to declare a 30,000 ha national park to include high alpine habitats (Rodgers & Panwar 1988).

The Sanctuary does not require any habitat improvement through human intervention. Habitat improvement would be achieved by the management of grazing. The Gujjars who have recently made inroads into the area should be diverted to other grazing areas because livestock will permanently degrade the fragile habitat.

The Hindu temples in the sanctuary are of great cultural value. They attract thousands of pilgrims every year, who exert tremendous pressure on the fragile resources of this IBA. Negative impacts from tourism are evident in the Mandakini Valley, particularly in the vicinity of Kedarnath temple, from where a large amount of minor forest produce and scrub have been removed.

Poaching, particularly of Musk Deer, continues in less accessible areas. Grazing by domestic livestock (goats, sheep, and water-buffalo), burning of pastures, and collection of forest products and medicinal herbs are all unregulated. This is more so in the areas designated as *van panchayats*. Forest fires pose a major threat to the moist forest formations, and in recent years considerable damage has been done by them. Thus, the forest understorey is heavily degraded in places.

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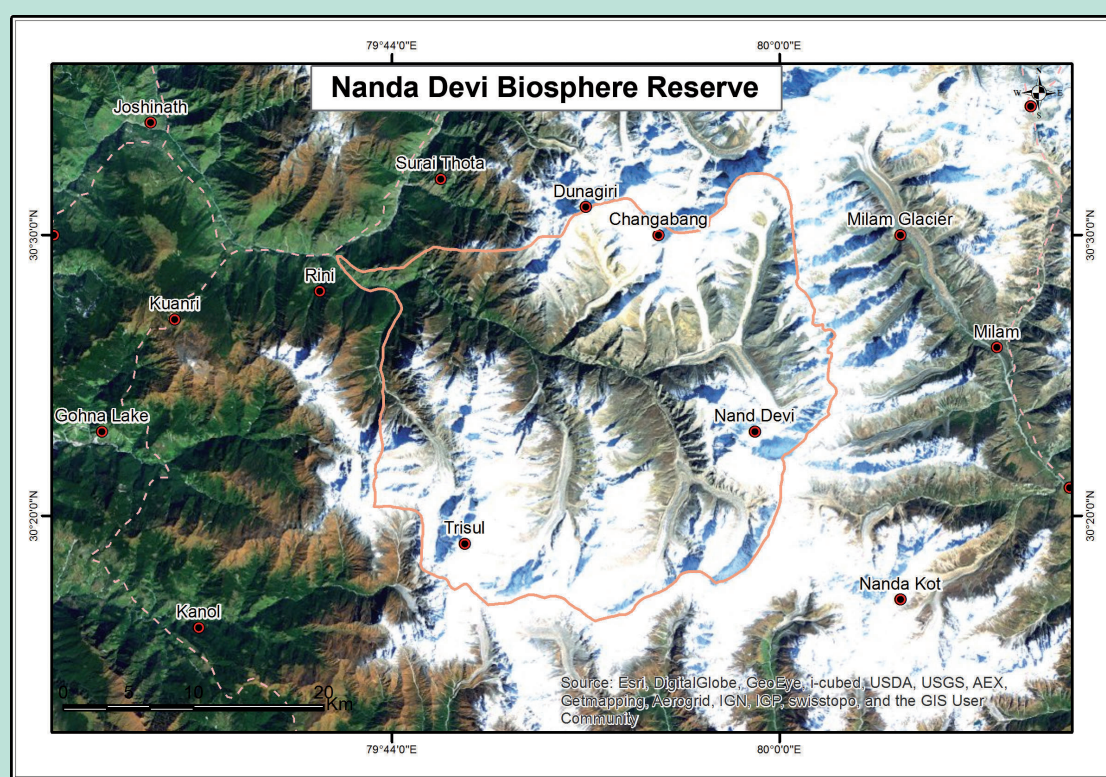
NANDA DEVI BIOSPHERE RESERVE

IN-UT-08

IBA Site Code	: IN-UT-08	Altitude	: 2,100–7,817 msl
State	: Uttarakhand	Rainfall	: Not available
District	: Chamoli, Bageshwar	Temperature	: Not available
Coordinates	: 30° 21' 03" N, 79° 19' 08" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Dry Temperate Forest, Moist Temperate Forest, Sub-tropical Pine Forest, Sub-alpine Dry Scrub
Area	: 63,033 ha		

IBA CRITERIA : A1 (Threatened species), A2 (Endemic Bird Area 128: Western Himalaya)

PROTECTION STATUS: National Park, established in August 1982.



GENERAL DESCRIPTION

The Nanda Devi Biosphere Reserve is situated in the Kumaon and Garhwal regions of Western Himalaya, in the districts of Chamoli, Pithoragarh, and Almora. It covers an area of 586,069 ha, with two core zones, almost the entire Nanda Devi National Park (62,462 ha) and the Valley of Flowers National Park (8,800 ha), and an outer buffer zone of 514,857 ha. Here we consider only Nanda Devi NP as an IBA. The Valley of Flowers NP has been recommended as a separate IBA.

The national park is one of the most spectacular high-altitude wilderness areas in the Himalaya. Nanda Devi (7,817 m), a natural monument, and India's second highest

peak, stands high above the basin of the Rishi Ganga river, which has cut for itself one of the finest gorges in the world. Unlike many other Himalayan areas, it is largely free from human settlement and has remained unspoiled due to its inaccessibility, particularly the forests of the lower Rishi Valley. Nanda Devi National Park meets Criteria (vii) and (x) of the World Heritage Convention, based on its exceptional natural beauty and populations of threatened animals. Along with the Valley of Flowers (an IBA), Nanda Devi NP is considered as World Heritage Site.

Access to Nanda Devi NP is very difficult, due to a series of high ridges with peaks such as Lata, Jhandidhar, Dunagiri, Kalanka, Rishiparvat, Nanda Devi East, Nanda

Khata, and Trishul, which also form the boundary of the core zone. Thus, not only is Nanda Devi protected by law, but its geographic features act as an effective obstacle to human and livestock entry.

AVIFAUNA

A total of 112 bird species has been recorded from Nanda Devi, 83 within the national park and 29 around Joshimath in the buffer zone of the biosphere reserve and the Oak forest at Auli (Sankaran 1995).

Sankaran (1995) found that species richness was highest in temperate forests with 47 species (37%), 24 of which were seen only in this habitat dominated by Oak, Fir, Birch, and Rhododendron. The species richness of this habitat is likely to be much higher, as this was the least surveyed of all habitat types in the park. Sub-alpine forest ranked next in species richness with 43 species recorded by Sankaran (1995), 18 of which were seen only in this habitat type. Nine species (8%), from a total of 32 recorded, were exclusive to the alpine pastures.

Only 20 species (8 exclusively) were recorded in degraded forest and agricultural land. This indicates that the majority of species found in this park are specialists requiring primary forest cover (Sankaran 1995).

Almost all species of avifauna in the Himalaya show altitudinal migration, ascending to sub-alpine and alpine

VULNERABLE	
Cheer Pheasant	<i>Catreus wallichi</i>
NEAR THREATENED	
Himalayan Griffon	<i>Gyps himalayensis</i>
Bearded Vulture	<i>Gypaetus barbatus</i>
ENDEMIC BIRD AREA 128: WESTERN HIMALAYA	
Cheer Pheasant	<i>Catreus wallichi</i>
White-throated Tit	<i>Aegithalos niveogularis</i>

areas in summer to breed, and descending to temperate and tropical areas in the winter.

Three species of pheasant are reported from Nanda Devi NP: Cheer Pheasant *Catreus wallichi*, Himalayan Monal *Lophophorus impejanus*, and Koklass Pheasant *Pucrasia macrolopha*. While the first is globally threatened, and considered Vulnerable by BirdLife International (2001), the other two are still common in the Western Himalaya. Other Galliformes include Snow Partridge *Lerwa lerwa* and Himalayan Snowcock *Tetraogallus himalayensis* (Sankaran 1995). Sankaran (1995) did not find Cheer Pheasant during his survey of the higher reaches of Nanda Devi, but it is reported from slopes near Reni village.

Nanda Devi NP lies in the Western Himalaya Endemic Bird Area 128 (Stattersfield *et al.* 1998). In this EBA, a suite of 11 species has been listed, of which only two species could



High altitude Nanda Devi National Park and Biosphere Reserve rises from 2,100 to 7,817 m. Most of it is covered with permanent glaciers and snow-peaks. The elusive Snow Leopard *Panthera uncia* is found in the high altitude tree-less mountains and valleys as shown above



DHIRTIMAN MUKHERJEE

IBAs not only protect birds and large mammals but also provide habitat for species such as Indian or Royle's Pika *Ochotona roylei*

be found here. However, as Sankaran (1995) pointed out, further studies are required to provide a comprehensive bird list for this interesting site. This site has been designated an IBA on the basis of A1 and A2 criteria, but it could qualify under A3 (biome-restricted assemblage) also.

OTHER KEY FAUNA

The most important mammal is the Snow Leopard *Panthera uncia*, which occurs in the alpine and sub-alpine zones. Its main natural prey are Blue Sheep *Pseudois nayaur*, Himalayan Musk Deer *Moschus leucogaster*, and Himalayan Tahr *Hemitragus jemlahicus*. Other wildlife, especially mammalian, has been described by Tak & Kumar (1987) and Sathyakumar (1993).

LAND USE

- Nature conservation and research
- Tourism and recreation
- Grazing

THREATS AND CONSERVATION ISSUES

- Poaching, especially of Musk Deer and Snow Leopard
- Mountaineering expeditions

The lower temperate and tropical forests are perhaps the most vulnerable habitats in the Himalaya as they

are inhabited and most deforestation is taking place here (Dhananjai Mohan *pers. comm.* 2001).

In the Himalaya, biotic pressures such as livestock grazing play a significant role in virtually all temperate, sub-alpine, and alpine areas during the summer, with deleterious effects on wildlife, particularly because optimal areas for livestock grazing are also prime habitats of the Himalayan Monal and Cheer Pheasant.

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NEW FOREST CAMPUS

IN-UT-08

IBA Site Code	: IN-UT-09	Altitude	: 670 msl
State	: Uttarakhand	Rainfall	: 2,000 mm
District	: Dehra Dun	Temperature	: -1 °C to 43 °C
Coordinates	: 30° 20' 30" N, 78° 00' 00" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Tropical Moist Deciduous, Tropical Secondary Scrub
Area	: 450 ha		

IBA CRITERIA : A3 (Biome 5: Eurasian High Montane – Alpine and Tibetan; Biome 7: Himalayan Temperate Forest; Biome 8: Sino-Himalayan Subtropical Forest; Biome 11 Indo-Malayan Dry Zone)

PROTECTION STATUS: Not officially protected. (Map not available)

GENERAL DESCRIPTION

New Forest Campus is situated in the Dehra Dun district of Uttarakhand. The Campus houses the internationally renowned Forest Research Institute and is one of the most beautiful campuses of India.

The Campus is a mosaic of land uses, varying from densely inhabited housing colonies to Mixed Moist Deciduous natural forests. The northern boundary of the Campus is the valley of the seasonal River Tons, which descends from the Himalaya. The river, which is a mere trickle in winter, has dry scrub jungle on its banks. The slopes leading to the valley are covered with Mixed Moist Deciduous forest. The Campus is dominated by a very large building, more than 85 years old, surrounded by sprawling lawns. There are extensive old plantations of Chir Pine *Pinus roxburghii* now almost a century old, Teak *Tectona grandis*, and many species of bamboo. Some mixed plantations, a large, fairly open arboretum with experimental gardens and a botanical garden also occupy a sizeable area. The inhabited area has widely spaced bungalows, surrounded by a lot of vegetation and crowded housing colonies.

A number of habitats have been identified in the campus: Tons river, irrigation canal, paddy fields, Tons valley forest (Moist Deciduous), Champion block forest (Moist Deciduous and plantations), Tons valley scrub jungle, experimental gardens, botanical gardens, arboretum, bungalows, lawns, fields, the large main building, and housing colonies.

AVIFAUNA

Such a variety of habitats, as well as the presence of both Himalayan and Subcontinental avifauna, result in a very high diversity of birds in New Forest. A total of 261 species belonging to 43 families has been recorded. Of these, 111 are migrants, 120 residents, and 30 are considered

vagrants (Mohan 1996). Owing to its special location, more birds have been added to the list and presently it stands at almost 300 species.

New Forest has a long history of birdwatching, with records by Osmaston (1935) and Wright (1949, 1957). There are extensive notes on the avifauna of the Campus. The most important contributions were made by George (1957, 1962), who listed 220 birds, with details of their habitat use and migration, studied over a decade. Mohan (1993) has been studying the birds of New Forest since 1983, adding another 41 species to the list. Hooded Pitta *Pitta sordida*, which has only been recorded once from the West Himalayan foothills, has been reported from the Campus (Mohan & Chellam 1990). Ten species of woodpeckers and 18 species of flycatchers are known from this IBA.

Based on the classification of BirdLife International (undated), the New Forest Campus lies within Sino-Himalayan Subtropical Forest (Biome 8). Ninety-five bird species represent Biome 8 and 15 of them occur in New Forest Campus. As this site is in the foothills of the Himalaya, many migratory birds from other biomes are also seen. For instance, Tickell's Leaf-warbler *Phylloscopus affinis*, Sulphur-bellied Warbler *Phylloscopus griseolus*, and Wallcreeper *Tichodroma muraria*, the birds listed in Biome 5 (Eurasian High Montane – Alpine and Tibetan) by BirdLife International (undated), occur here in winter only. Similarly, 16 species of Biome 7 (Sino-Himalayan Temperate Forest) have been identified from this IBA, most of them winter migrants.

However, the greatest overlap is seen with Biome 11 (Indo-Malayan Tropical Dry Zone). BirdLife International (undated) has listed 59 species in this biome, of which 22 occur in New Forest Campus. This is to be expected, for though this site occurs in the Doon Valley and is surrounded by the Shivalik Hills, it is close to the large Tropical Dry

BIOME 5: EURASIAN HIGH MONTANE (ALPINE AND TIBETAN)

Tickell's Warbler	<i>Phylloscopus affinis</i>
Olivaceous Leaf-warbler	<i>Phylloscopus griseolus</i>
Wallcreeper	<i>Tichodroma muraria</i>

BIOME 7: HIMALAYAN TEMPERATE FOREST

Himalayan Rubythroat	<i>Luscinia pectoralis</i>
Indian Blue Robin	<i>Luscinia brunnea</i>
Blue-capped Redstart	<i>Phoenicurus caeruleocephalus</i>
Striated Laughingthrush	<i>Garrulax striatus</i>
Scaly-breasted Wren-babbler	<i>Pnoepyga albiventer</i>
Chestnut-headed Tesia	<i>Tesia castaneocoronata</i>
Large-billed Leaf-warbler	<i>Phylloscopus magnirostris</i>
Western Crowned Warbler	<i>Phylloscopus occipitalis</i>
Orange-gorgeted Flycatcher.	<i>Ficedula strophiciata</i>
Ultramarine Flycatcher	<i>Ficedula superciliaris</i>
Slaty-blue Flycatcher	<i>Ficedula tricolor</i>
Rufous-bellied Niltava	<i>Niltava sundara</i>
Spot-winged Crested Tit	<i>Parus melanolophus</i>
Green-backed Tit	<i>Parus monticolus</i>
Yellow-breasted Greenfinch	<i>Carduelis spinoides</i>
Bar-tailed Treecreeper	<i>Certhia himalayana</i>

BIOME 8: SINO-HIMALAYAN SUBTROPICAL FOREST

Blue-throated Barbet	<i>Megalaima asiatica</i>
Black-winged Cuckooshrike	<i>Coracina melaschistos</i>
Rosy Minivet	<i>Pericrocotus roseus</i>
Himalayan Bulbul	<i>Pycnonotus leucogenys</i>
Black Bulbul	<i>Hypsipetes leucocephalus</i>
Blue-headed Rock-thrush	<i>Monticola cinclorhynchus</i>
Tickell's Thrush	<i>Turdus unicolor</i>
Grey-winged Blackbird	<i>Turdus boulboul</i>
Rufous-chinned Laughingthrush	<i>Garrulax rufogularis</i>
Rusty-cheeked Scimitar-babbler	<i>Pomatorhinus erythrogenys</i>
Black-chinned Babbler	<i>Stachyris pyrrhops</i>
Grey-headed Warbler	<i>Seicercus xanthoschistos</i>
Small Niltava	<i>Niltava macgrigoriae</i>
Maroon Oriole	<i>Oriolus traillii</i>
Grey Treepie	<i>Dendrocitta formosae</i>

BIOME 11: INDO-MALAYAN DRY ZONE

Red-headed Vulture	<i>Aegypius calvus</i>
White-eyed Buzzard	<i>Butastur teesa</i>
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i>
Yellow-footed Green-pigeon	<i>Treron phoenicoptera</i>
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>
Indian Grey Hornbill	<i>Ocyrceros birostris</i>
Brown-headed Barbet	<i>Megalaima zeylanica</i>
Lineated Barbet	<i>Megalaima lineata</i>
Black-rumped Flameback	<i>Dinopium benghalense</i>
Ashy-crowned Sparrow-lark	<i>Eremopterix grisea</i>
Black-headed Cuckooshrike	<i>Coracina melanoptera</i>
Common Woodshrike	<i>Tephrodornis pondicerianus</i>
Small Minivet	<i>Pericrocotus cinnamomeus</i>
Indian Robin	<i>Saxicoloides fulicata</i>
Jungle Babbler	<i>Turdoides striatus</i>
Ashy Prinia	<i>Prinia socialis</i>
White-browed Fantail	<i>Rhipidura aureola</i>
Brahminy Starling	<i>Sturnus pagodarum</i>
Bank Myna	<i>Acridotheres ginginianus</i>
White-bellied Drongo	<i>Dicrurus caerulescens</i>

Zone of peninsular India. Therefore, many species of the latter biome move to the Doon Valley as summer or winter migrants. Some summer migrants breed as well.

Studies on Indian birds suggest that there could be many other such areas which would qualify for IBA criteria, if we knew their bird life in detail as we now know the birds of this Campus.

OTHER KEY FAUNA

There are not many wild mammals, except an occasional Leopard *Panthera pardus* or Sambar *Rusa unicolor*. Golden Jackal *Canis aureus* and Jungle Cat *Felis chaus* are two other predators.

LAND USE

- Human habitation
- Nature conservation and research
- Educational and Training Institute
- Forestry

THREATS AND CONSERVATION ISSUES

There are no major conservation issues in this man-altered habitat. New buildings have come up, but at the same time appropriate plantation has been done in the Campus.

KEY CONTRIBUTOR

Dhananjai Mohan

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RAJAJI NATIONAL PARK

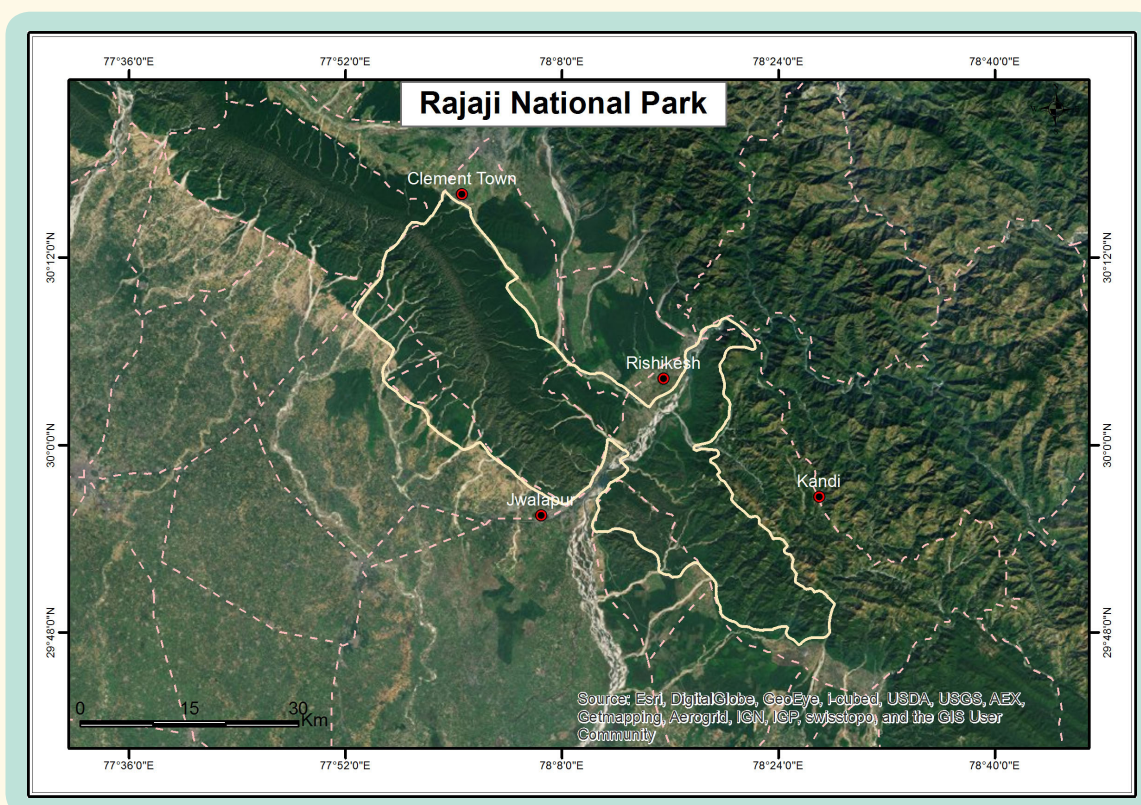
IBA Site Code	: IN-UT-10
State	: Uttarakhand
District	: Dehra Dun, Haridwar, Pauri Garhwal
Coordinates	: 30° 03' 23" N, 78° 03' 53" E
Ownership	: State
Area	: 81,954 ha

Altitude	: 302–1,000 msl
Rainfall	: 1,200–1,500 mm
Temperature	: 13 °C to 39 °C
Biogeographic Zone	: Himalaya and Gangetic Plains
Habitats	: Tropical Dry Deciduous Forest, Sub-tropical Pine Forest, Tropical Moist Deciduous Forest

IN-UT-10

IBA CRITERIA : A1 (Threatened species)

PROTECTION STATUS: National Park, established in August 1983.



GENERAL DESCRIPTION

Rajaji National Park is situated in the Shivalik hills and outer Himalaya of Uttarakhand state in India. It is spread over 81,954 ha in the districts of Dehra Dun, Haridwar, and Pauri Garhwal. The tract is mainly hilly, traversed by a number of alternating steep ridges and valleys. The River Ganga bisects the park. Rajaji NP was set up to protect the habitat of the Asian Elephant *Elephas maximus* and Tiger *Panthera tigris*. Three wildlife sanctuaries – Rajaji, Chilla, and Motichur, and the surrounding reserve forests, were merged to create this national park.

The park area to the west of the River Ganga is part

of the Shivalik range and has a prominent northwest to southeast ridge running through it (Pandey *et al.* 1994). The area north of this ridge slopes gently into the Dehra Dun valley and is covered with dense Sal *Shorea robusta* forests. Champion & Seth (1968) classified it as Moist Shiwalik Sal Forest. The area south of the ridge has a jagged topography with a number of steep ridges which emerge from the main Shivalik ridge and have narrow valleys between them, which in monsoon turn into swift rivers. The dry riverbeds are locally called *rau*. The ridges are grassy, with occasional trees. On the south of the main ridge there is Dry Shiwalik Sal Forest, with *Anogeissus latifolia* on the slopes, associated

with Sal in some places. Some areas of the national park are under plantations of *Tectona grandis*, *Ailanthus excelsa*, and *Haplophragma adenophyllum*. The Park is one of the finest examples of the *bhabar* forest zone in India, i.e. the belt between the Himalaya and the *terai*.

AVIFAUNA

A total of 312 bird species has been recorded. Of these, 151 are residents, 87 migrants, 49 are altitudinal migrants, and 7 are local migrants, while the status of the remaining 18 is unknown. For some species, Rajaji forms the western edge of their range, e.g., Great Pied Hornbill *Buceros bicornis* and Golden-fronted Leafbird *Chloropsis aurifrons* (Pandey *et al.* 1995). The Common Green Magpie *Cissa chinensis*, a denizen of Broadleaf Evergreen and Moist Deciduous forest, has been reported from the forest adjoining Rajaji NP, which links it with Corbett NP.

Rajaji NP only has ten globally Threatened and 15 Near Threatened species.

Rajaji NP is extremely rich in forest birds. For example, it has 11 species of woodpeckers, 5 species of barbets, and 3 species of hornbills, including the Near Threatened Great Pied Hornbill.

Under the Western Himalaya Endemic Bird Area, Stattersfield *et al.* (1998) have listed Brooks's Leaf-warbler *Phylloscopus subviridis* and Tytler's Leaf-warbler *P. tytleri* as restricted-range species. Both species are winter migrants to the park (Pandey *et al.* 1994).

According to the BirdLife International (undated)

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

VULNERABLE

Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Indian Spotted Eagle	<i>Clanga hastata</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>
Bristled Grassbird	<i>Chaetornis striata</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Falcated Duck	<i>Anas falcata</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Bearded Vulture	<i>Gypaetus barbatus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
River Lapwing	<i>Vanellus duvaucelii</i>
River Tern	<i>Sterna aurantia</i>
Blossom-headed Parakeet	<i>Psittacula roseata</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Red-breasted Parakeet	<i>Psittacula alexandri</i>
Great Pied Hornbill	<i>Buceros bicornis</i>



DHRTIMAN MUKHERJEE

Many meandering streams and rivers called *rao* pass through Rajaji NP giving it a characteristic look which no other PA/IBA has in Uttarakhand. These are ideal habitat for many riverine birds such as the Near Threatened River Lapwing *Vanellus duvaucelii* and River Tern *Sterna aurantia*

classification of biomes, Rajaji NP occurs in Sino-Himalayan Subtropical Forest (Biome 8). However, it has more species of Biome 7 (Sino-Himalayan Temperate Forest) than Biome 8, especially in winter when the birds move down into these forests. A total of 112 species has been identified in Biome 7, and Rajaji NP has 12 of them, all recorded in winter.

There is a barrage on the River Ganga near Haridwar city. The backwaters of the reservoir, as well as a small stretch of the River Ganga, lie in the national park. These waterbodies attract a lot of resident and migratory waterbirds in winter. Thirteen species of birds have been identified at the reservoir, including Oriental Darter *Anhinga melanogaster*, Painted Stork *Mycteria leucocephala*, Black-necked Stork *Ephippiorhynchus asiaticus*, as well as Ferruginous Duck *Aythya nyroca*, birds considered Near Threatened by BirdLife International (2001).

OTHER KEY FAUNA

The area is highly important as the western limit of the Asiatic Elephant *Elephas maximus* and the Tiger *Panthera tigris*. Some other large mammals in Rajaji NP include Leopard *Panthera pardus*, Spotted Deer *Axis axis*, Sambar *Rusa unicolor*, Nilgai *Boselaphus tragocamelus*, and Himalayan Brown Goral *Naemorhedus goral*. This park is a good place to see Goral (Johnsingh 2001). The forests east of River Ganga are occasionally visited by Sloth Bear *Melursus ursinus* and Asiatic Black Bear *Ursus thibetanus* in winter.

LAND USE

- Nature conservation and research
- Tourism and recreation
- Human habitation
- Cultivation

THREATS AND CONSERVATION ISSUES

- Fragmentation due to roads and canals
- Poaching, particularly along its southern boundary
- Illicit felling on the periphery
- Invasive species such as Lantana

A major community, the Gujjars, live inside the national park in scattered *deras* (settlements). The resettlement of Gujjars has been a major issue related to Rajaji NP for nearly two decades, with the matter being taken to the Supreme Court. Despite clear directives from the Court, their resettlement has not been completed, though nearly two-thirds of Rajaji is now free from them and has shown



Great Slaty Woodpecker *Mulleripicus pulverulentus* is found in the tall stands of Sal *Shorea robusta*. They are found in pairs or small flocks of 2-5 birds

RAMKI SRINIVASAN

remarkable recovery and a breeding population of tigers has been established.

Rajaji does not have a natural buffer around much of its boundary. The areas adjoining the park have high densities of human settlements that depend on the forest resources of the national park. There are also human-animal conflicts. The villages surrounding Rajaji require large-scale eco-development programmes. The creation of areas that are free from human habitation and constitute ideal habitats for Asian Elephant and Tiger has been suggested for the buffer zone of Rajaji NP (Johnsingh *pers. comm.* 2003, A.S. Negi *pers. comm.* 2003).

Another major issue is the fragmentation of the national park by canals, roads, railway lines, army ammunition dump, and three settlements of people displaced by the Tehri Dam. Fortunately, the people of Khand Gaon III, which is in the Chilla-Motichur corridor, have agreed to move and the army has agreed to shift the ammunition dump which is also in the corridor area. The Forest Department has identified land for them. But the decisions are far from being



Sometimes up to 300 vultures are seen, mainly consisting of Griffon Vulture *Gyps fulvus*, Himalayan Vulture *G. himalayensis*, and few White-rumped *G. bengalensis* and Slender-billed *G. tenuirostris* vultures

implemented in the field, even though substantial headway has been made in recent years. These are sensitive socio-political issues, which need careful and timely attention.

Rajaji NP has serious problems pertaining to weed infestation and introduction of exotics. Vast areas in the southern flat terrain as well as riverine areas of Motichur are infested with Lantana. Decline in habitat quality increases the problem of crop raiding by elephants (Williams *et al.* 2001). The invasive weed problem needs urgent attention.

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A.J.T. Johnsingh, S.P. Goyal.

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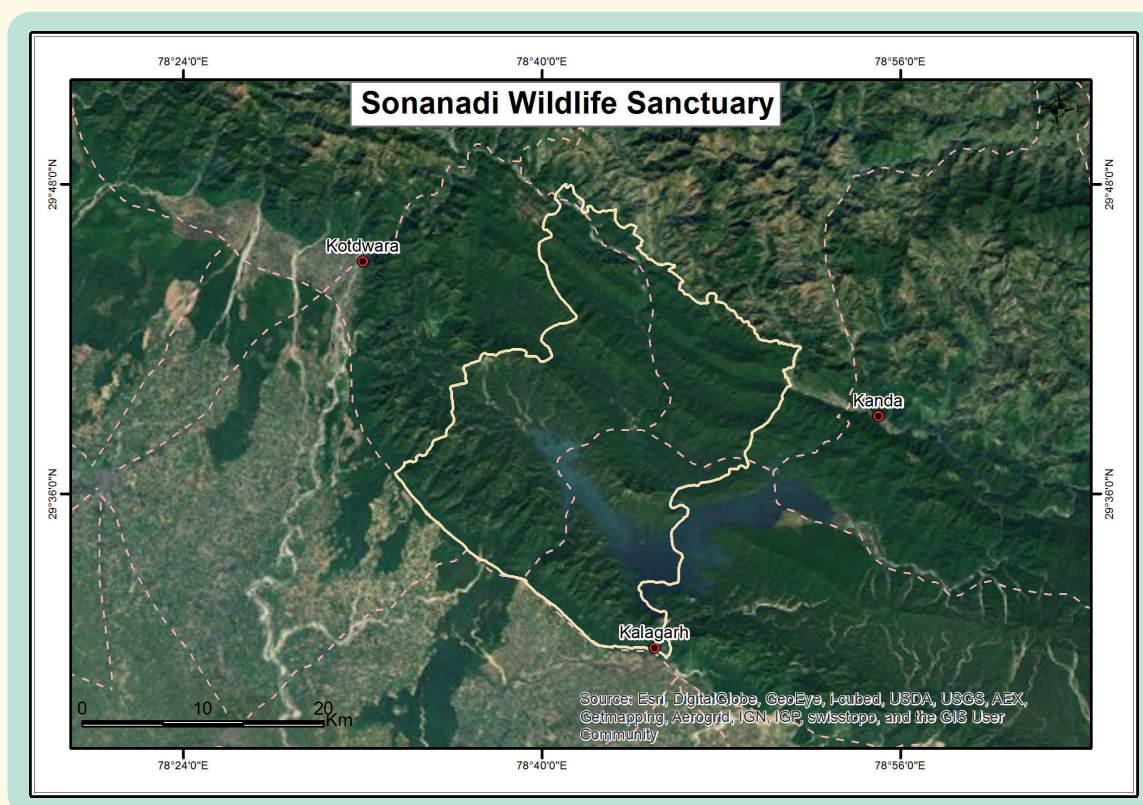
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SONANADI WILDLIFE SANCTUARY

IBA Site Code	: IN-UT-11	Altitude	:
State	: Uttarakhand	Rainfall	: >1,500 mm
District	: Garhwal	Temperature	: 3 °C to 40 °C
Coordinates	: 29° 37' 33" N, 78° 41' 05" E	Biogeographic Zone	: Gangetic Plain
Ownership	: State	Habitats	: Tropical Dry Deciduous Forest, Sub-tropical Pine Forest, Tropical Moist Deciduous Forest
Area	: 30,118 ha		

IBA CRITERIA : A1 (Threatened species) Data Deficient

PROTECTION STATUS: Wildlife Sanctuary, established in January 1987.



GENERAL DESCRIPTION

The Sonanadi Wildlife Sanctuary (WLS) is located in the Kotdwar *tehsil* of Pauri Garhwal district in Uttarakhand. It is named after the Sonanadi (river of gold). Deposits of gold have been reported along this river, hence the name. This sanctuary spans an area of 30,118 ha of prime forest across the Ramganga river, adjoining the famous Corbett National Park.

The Shivalik-Terai is one of the most threatened ecosystems of the country and receives considerable conservation attention. Sonanadi WLS forms a critical part of the habitat of the northwest population of Asian Elephant

Elephas maximus. There are three major sub-populations in Corbett-Rajaji NP. Sonanadi is significant in that it constitutes a forest corridor between the Corbett and the Rajaji populations to facilitate their movement.

Sonanadi WLS along with Corbett NP and its buffer areas together comprise Corbett Tiger Reserve, which holds the highest density of tigers and second largest population of Tiger *Panthera tigris* in the world (A.J.T. Johnsingh, *pers. comm.* 2002).

The greater part of the sanctuary is covered with Sal *Shorea robusta* forests. *Anogeissus latifolia* can be seen on the slopes, associated with Sal in some places. In earlier



DHANANJAY MOHAN

Sonanadi adjoins Corbett NP so it has similar forest types and bird life. Although not much has been done here, eight species of globally threatened birds have been identified till now

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
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VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeetus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Pallid Harrier	<i>Circus macrourus</i>
Great Pied Hornbill	<i>Buceros bicornis</i>

days, many parts of the original forest were cleared to raise plantations of *Tectona grandis*, *Ailanthus excelsa*, and *Haplophragma species??*.

AVIFAUNA

Although no work has been carried out on the bird communities of Sonanadi WLS, its birdlife is assumed to be rich as it adjoins Corbett where nearly 550 species of birds are reported (Sharma *et al.* 2003). However, Sonanadi does not have as great a habitat diversity as Corbett. Two Critically Endangered species of vulture are found here but

they are widespread, especially the White-rumped Vulture *Gyps bengalensis*.

OTHER KEY FAUNA

Sonanadi has almost all the larger mammals that are found in Corbett and Rajaji National Park, such as Asiatic Elephant *Elephas maximus*, Tiger *Panthera tigris*, Leopard *P. pardus*, Sambar *Rusa unicolor*, Cheetal *Axis axis*, Barking Deer *Muntiacus muntjak*, Nilgai *Boselaphus tragocamelus*, Wild Boar *Sus scrofa*, and Sloth Bear *Melursus ursinus*, Golden Jackal *Canis aureus*, and Striped Hyaena *Hyaena hyaena* are the smaller carnivores. No data are available on reptiles and amphibians.

LAND USE

- Human habitation
- Nature conservation and research
- Tourism and recreation
- Grazing

THREATS AND CONSERVATION ISSUES

- Livestock grazing
- Disturbance to birds (poaching, killing, trapping)
- Unsustainable exploitation of forest products

Although there are no villages within the sanctuary area, the buffer and periphery of Sonanadi WLS harbour 200 villages and 46 settlements. There are Gujjar *deras* (settlements) in many parts of the sanctuary, that cause considerable disturbance. They are under the process of relocation outside the sanctuary.

Poaching is a constant threat to species such as Tiger, Leopard, and Asian Elephant.

Transmission of diseases from domestic to wild animals is another threat. Inoculation of livestock within a 5-km zone of influence is a major management challenge. Poisoning and dynamiting of rivers for fish, shooting and trapping of animals and birds, cattle grazing, and non-timber forest produce (NTFP) collection are the major areas of concern for management. As the sanctuary is not demarcated into different zones, there is unrestricted use of rich habitats for grazing, tourism, and other unregulated anthropogenic activities.

KEY CONTRIBUTOR

IBA team.

KEY REFERENCE

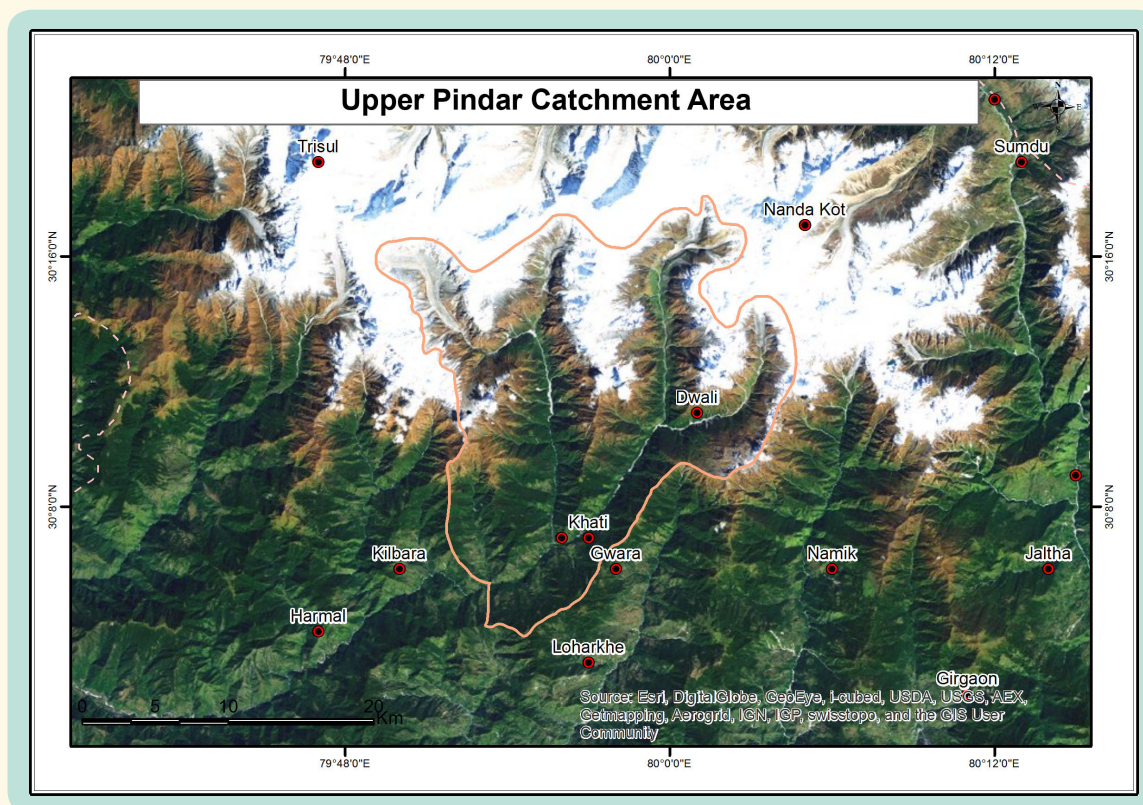
Sharma, M., Harvey, B., Devasar, N. and Grewal, B. (2003) *A checklist of the birds of Corbett Tiger Reserve*. Published by the Field Director, Corbett Tiger Reserve, Ramnagar, Uttarakhand.

UPPER PINDAR CATCHMENT AREA

IBA Site Code	: IN-UT-12	Altitude	: Not available
State	: Uttarakhand	Rainfall	: c. 1,000–2,000 mm
District	: Bageshwar	Temperature	: Not available
Coordinates	: 30° 15' 08" N, 80° 03' 01" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Himalayan Wet Temperate Forest, Sub-tropical Pine Forest, Alpine Moist Pasture
Area	: 20,000 ha		

IBA CRITERIA : A1 (Threatened Species), A2 (Endemic Bird Area 128: Western Himalaya), A3 (Biome 7: Sino-Himalayan Temperate Forest, Biome 8: Sino-Himalayan Subtropical Forest)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

The Upper Pindar Valley lies in Bageshwar district of the Kumaon region in Uttarakhand. The Pindar Valley and two of its upper level tributaries, namely Sunderdhunga Gad and Kaphni Gad, constitute a variety of diverse temperate to alpine vegetation communities. The Reserve Forests of Dhakuri block and Sunderdhunga block (3,087 ha) constitute the forested part of this c. 20,000 ha IBA. The remaining alpine and snow covered areas have the status of civil forests. The area lies in the Kapkote range of Bageshwar Forest division. The forests of Khati *van panchayat* (village council), which are contiguous with the

aforementioned forest, provide ecological continuity and form important buffers.

The Pindari area is top ranking in the timber line zone of Uttarakhand hills, on the basis of botanical richness, uniqueness, and endemism (Dhar *et al.* 1999). A high degree of diversity has been recorded in the composition of forest communities. A number of species are considered sensitive species, due to their small population and narrow distribution range, or on account of the threats to them (Samant, Rawal, & Dhar 1993). The Pindari is the only non-protected area which was placed “on priority amongst the areas included in the conservation proposals for

Uttarakhand (Rodgers *et al.* 2000). The area is contiguous with the Nanda Devi National Park (an IBA), the dividing line being a very high, permanently snowbound ridge. Much of the area (northwards of Khati village) is included in the buffer area of Nanda Devi Biosphere Reserve, although the Reserve management has negligible presence here.

AVIFAUNA

The area has large and viable populations of five pheasants: Himalayan Monal *Lophophorus impejanus*, Satyr Tragopan *Tragopan satyra*, Koklass Pheasant *Pucrasia macrolopha*, Cheer Pheasant *Catreus wallichii*, and Kaleej Pheasant *Lophura leucomelanos* (R. Raza *pers. comm.* 2003). The Himalayan Snowcock *Tetraogallus himalayensis* is also found here (Rodgers & Panwar 1988). In the Endemic Bird Area of Western Himalaya, very few IBAs have five species of pheasant. However, no study has been conducted to assess their status.

A detailed inventory of birds is not available, however, Sultana & Khan (2000) recorded a total of 185 bird species from Almora district (which includes the present day Bageshwar district), which included 151 resident, 26 resident/migratory, and 8 migratory species. In detailed surveys of two Oak forests in this IBA, they recorded 120 bird species, of which 28 were birds of Sino-Himalayan Temperate Forest (Biome 7), 9 belonged to Sino-Himalayan Subtropical Forest (Biome 8) and four to the Eurasian High Montane (Biome 5) (Sultana & Khan 2000; R. Raza, *pers. comm.* 2003).

This site comes under the Western Himalaya Endemic Bird Area (EBA) (Stattersfield *et al.* 1998), where 11 bird species have been listed as restricted-range (BirdLife International, undated). Cheer Pheasant was recorded by Sultana & Khan (2000). Considering the altitudinal range and vegetation types of this IBA, there are probably more restricted-range species present.



Bearded Vulture *Gypaetus barbatus*, a Near Threatened species, is found in the high altitude areas of this IBA

VULNERABLE

Cheer Pheasant	<i>Catreus wallichii</i>
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NEAR THREATENED

Himalayan Griffon	<i>Gyps himalayensis</i>
Bearded Vulture	<i>Gypaetus barbatus</i>

ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Cheer Pheasant	<i>Catreus wallichii</i>
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BIOME 7: SINO-HIMALAYAN TEMPERATE FOREST

Satyr Tragopan	<i>Tragopan satyra</i>
Koklass Pheasant	<i>Pucrasia macrolopha</i>

BirdLife International (undated) has identified 112 species of Sino-Himalayan Temperate Forest (Biome 7), of which 28 are found here. Many of these species are breeding residents and probably found in significant numbers, as the forest habitat is largely intact.

The Kumaon Himalaya, of which Upper Pindar Catchment is a part, have been explored relatively poorly as far as bird communities are concerned. Nevertheless, there are about 55 published accounts of birds from this region. Sultana & Khan (2000) compared their data of Ranikhet area (adjoining Almora district) with that of Briggs (1931) and found many changes. Out of 83 birds recorded in 1931 and 114 birds in 1995, there were 68 common species, 15 species exclusive to 1931 and 46 species were recorded only in 1995. This shows the extent of change taking place, mainly due to biotic pressures and probably also climate change. More work is required in the Kumaon Himalaya, especially in Nainital and Almora districts, for a comprehensive comparison of status of several bird species (Sultana & Khan 2000). The existing information shows that this region is extremely important for many Western Himalayan endemics.

OTHER KEY FAUNA

The area is said to have the largest herds of Himalayan Tahr *Hemitragus jemlahicus* in India, as well as Bharal *Pseudois nayaur*, Himalayan Musk Deer *Moschus leucogaster*, Himalayan Serow *Capricornis thar*, and Himalayan Brown Goral *Naemorhedus goral*. Snow Leopard *Uncia uncia* is probably present (Rodgers & Panwar 1988).

LAND USE

- Forestry
- Tourism

THREATS AND CONSERVATION ISSUES

- Poaching of Musk Deer for the musk pod
- Garbage left by trekkers
- Tourism

The Pindari area should be declared as a wildlife sanctuary, both on account of its rich biodiversity and the low biotic pressure in the area. The uppermost village in the Pindar Valley is Khati (c. 2200 m), situated at the confluence of Pindar and Sunderdhunga Gad.



DHIRTIMAN MUKHERJEE

Most parts of this IBA are covered with tree-less alpine pastures. In the lower reaches Pine Forest and Wet Temperate Forest are found. It has large populations of five pheasant species

The trek to Pindari glacier is one of the most popular in Uttarakhand state. The Forest Department and the Kumaon Mandal Vikas Nigam should work together to manage trekking so that it is ecologically sensitive. The area has great potential to become a centre for conservation education in the Himalaya.

The Upper Pindar Valley has a relatively difficult approach, as the only way to reach it is by trekking, involving a tough climb to Dhakuri Pass (c. 3000 m). This difficult climb discourages the forest staff from visiting this area regularly. Moreover, most of the area has broadleaf forests that are not very important commercially. Therefore, forestry was never practiced in the upper reaches of the Valley. This perhaps explains the absence of forest rest houses, which is not so in the rest of Kumaon.

The nearby reserve forests of the Namik forest block, 4,413.5 ha in extent, which are situated in the upper catchment area of the snow-fed Ramganga river and the associated alpine areas, are similar to the Pindari area in biodiversity value. All these could be considered for inclusion in the proposed Pindari Wildlife Sanctuary if the two components are properly connected.

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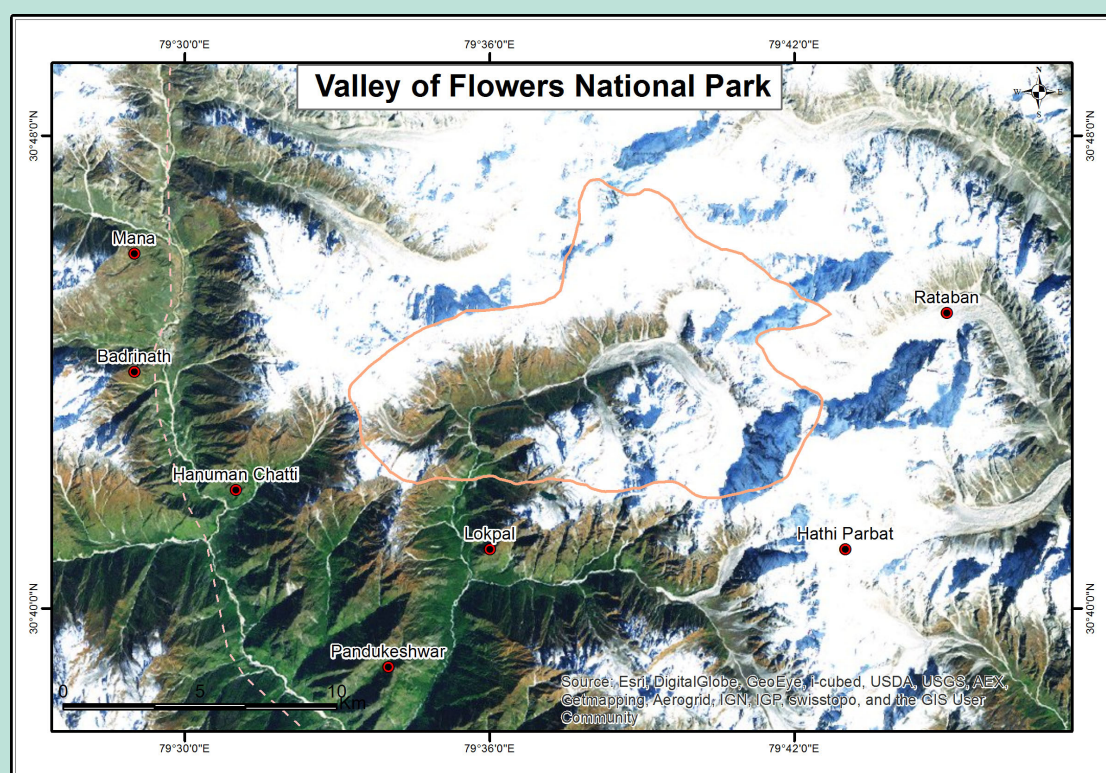
VALLEY OF FLOWERS NATIONAL PARK

IN-UT-13

IBA Site Code	: IN-UT-13	Altitude	: 3,200–6,590 msl
State	: Uttarakhand	Rainfall	: Not available
District	: Chamoli	Temperature	: -7 °C to 17 °C
Coordinates	: 30° 45' 56" N, 79° 39' 35" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Sub-alpine Forest, Alpine Moist Scrub, Alpine Moist Pasture
Area	: 8,750 ha		

IBA CRITERIA :A3 (Biome 7: Sino-Himalayan Temperate Forest)

PROTECTION STATUS: National Park, established in 1982.



GENERAL DESCRIPTION

The Valley of Flowers National Park, its buffer zone, and Khiron Valley are located in Chamoli district of Garhwal Himalaya. The River Pushpavati originates from Tipra glacier in the Valley, flows through the national park, joins River Bhyundar and drains into the Alaknanda at Gobindghat, a major tributary of the River Ganga. The national park is surrounded by the snow-clad summits of Nilgiri Parvat (6,407 m), Gauri Parvat (6,590 m), Rataban (5,400 m), Sapta Sringa (5,025 m), and Kunt Khal (5,855 m). The altitude ranges from 3,200 m to 6,590 m.

A British mountaineer Frank Smythe is credited with having discovered this valley. The upper Bhyundar Valley became internationally known following its exploration

by Smythe, first as a member of the successful Kamet Expedition in 1931 (Smythe 1932) and later in 1937, when he made an extensive herbarium collection. Overawed by the profusion of wild flowers, he named it Valley of Flowers. He recorded that the flora was as rich as or probably richer than any valley in Sikkim, with many plants of restricted distribution (Smythe 1938).

As the Valley received tremendous attention from tourists and plant explorers from all over the world, the Government of Uttar Pradesh notified its 8,750 ha area as a national park in 1982 for the conservation of its rich biodiversity. Forests constitute 529 ha, alpine pastures 1,863 ha, while 6,358 ha is estimated to be under permanent snow (Kala 1998).

NEAR THREATENED

Himalayan Griffon	<i>Gyps himalayensis</i>
Bearded Vulture	<i>Gypaetus barbatus</i>
Yellow-rumped Honeyguide	<i>Indicator xanthonotus</i>

There are three main vegetation zones in the park and its surroundings, namely Temperate, Sub-alpine and Alpine. The temperate zone (2,800–3,000 m) is characterized by broadleaf and coniferous forests. Sub-alpine forest (3,000–3,300 m) is dominated by *Betula utilis*, *Rhododendron campanulatum*, *Abies pindrow*, *Acer caesium*, and *Prunus cornuta*. The alpine zone begins at the treeline (3,500 m) and is dominated by herbaceous vegetation with some small shrubs.

Over 500 vascular plants are recorded from this IBA, of which 31 are rare and endangered, including 13 medicinal plants (Kala 1998).

AVIFAUNA

Dhananjai Mohan and Manoj V. Nair (*pers. comm.* 2003) have identified 82 bird species from this site. Except for the Himalayan Griffon *Gyps himalayensis*, Bearded Vulture *Gypaetus barbatus*, and Yellow-rumped Honeyguide *Indicator xanthonotus*, which are Near Threatened according to BirdLife International (2014), no other bird of conservation concern is found at the site. It must be added here that

detailed studies on the birdlife of this floral paradise have not been conducted. This site is one of the only two completely protected alpine grassland and scrub habitats in India, the other being Nanda Devi NP.

Although the Valley of Flowers is better known for its alpine pastures, at lower elevations it has Sino-Himalayan Temperate Forest, where many representative birds of Biome 7 are found. BirdLife International (undated) has listed 112 species under Biome 7, of which 29 have been recorded here (Dhananjai Mohan & Manoj. V. Nair, *pers. comm.* 2003). The Black-throated Tit *Aegithalos concinnus*, Grey-hooded Warbler *Seicercus xanthoschistos*, and Black-faced Warbler *Abroscopus schisticeps* belonging to Biome 8 (Sino-Himalayan Subtropical Forest) also occur here.

Although most of the national park falls in Biome 5 (Eurasian High Montane – Alpine and Tibetan) where BirdLife International (undated) has recorded 48 bird species, only seven were noted by Dhananjai Mohan & Manoj V. Nair (*pers. comm.* 2003). Surveys in the alpine zone may reveal good breeding populations of pipits and rosefinches, and such species as Spotted Bush-warbler *Bradypterus thoracicus* typical of alpine breeding bird communities in Garhwal Himalaya. The alpine meadows are under-explored and are likely to be excellent alpine bird habitats in view of their strict protection from grazing.



NAYAN KHANOLKAR

Valley of Flowers is perhaps the most famous national park of Uttarakhand State, rivaling with Corbett National Park. This high altitude Park does not have as many bird species as Corbett, but till now 82 species have been identified. Detailed study on bird life is required. Along with the flowers for which this Park is world famous, its bird diversity can attract many bird watchers



Himalayan Geranium *Geranium himalayense*



Himalayan Whorlflower *Morina longifolia*

The site has been designated as an IBA due to its well protected high altitude alpine and temperate forests.

OTHER KEY FAUNA

The resident fauna of the park includes Himalayan Musk Deer *Moschus leucogaster*, Himalayan Serow *Naemorhedus sumatraensis*, Himalayan Tahr *Hemitragus jemlahicus*, Asiatic Black Bear *Ursus thibetanus*, Bharal *Pseudois nayaur*, Mouse Hare *Ochotona roylei*, Red Fox *Vulpes vulpes*, and Himalayan Weasel *Mustela sibirica*.

LAND USE

- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Vishnuprayag Dam Project
- Resulting road construction and anthropogenic factors

The Vishnuprayag Dam in the upper Alaknanda Valley is the most serious threat to the park. In order to boost its generating capacity, it is proposed to divert water from the Pushpavati river via a 7.5 km long tunnel. The construction of the tunnel as well as a motorable road to the shrine at Hemkund Saheb would not only have a geographical impact on the Bhyundar Valley, but also change its biodiversity

values forever. In 2013, the 400 MW Vishnuprayag Hydroelectric Project suffered extensive damage during the floods that hit the state. The barrage of the project, being implemented by Jaiprakash Power Ventures Ltd (JPVL), a subsidiary of Jaiprakash Associates Limited (JAL), was covered completely with debris and the river has changed its course.

KEY CONTRIBUTOR

Dhananjai Mohan, Manoj V. Nair, Rashid Raza.

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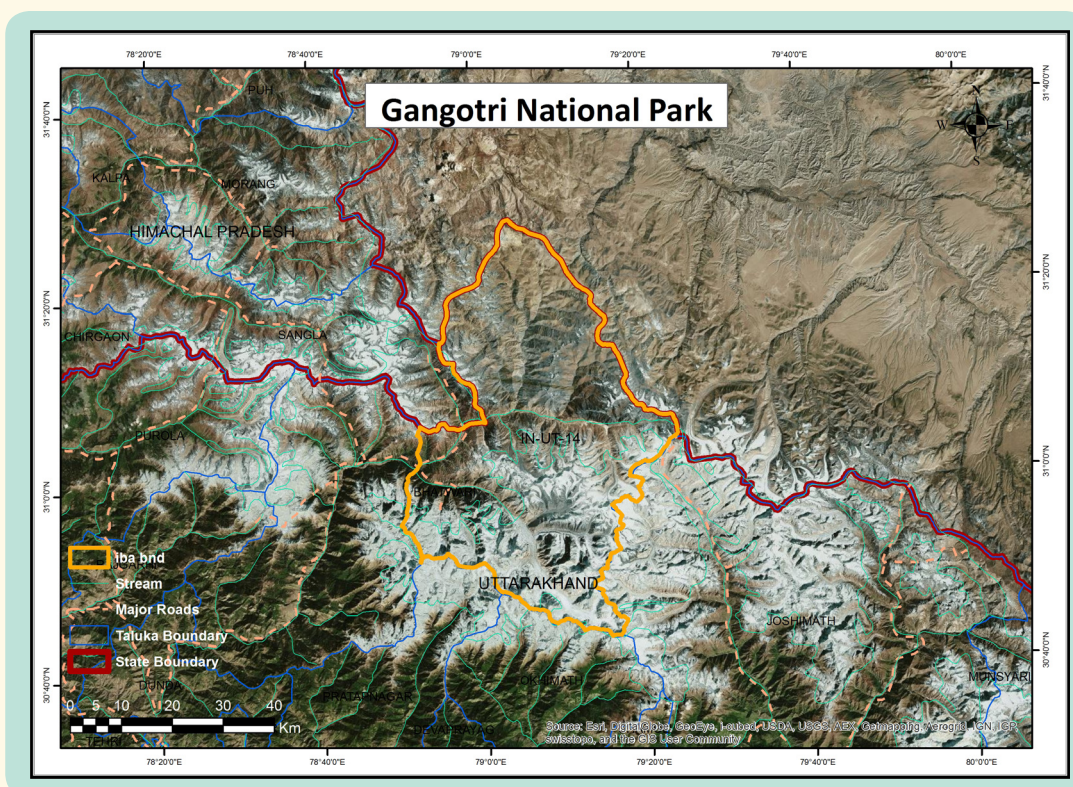
GANGOTRI NATIONAL PARK

IBA Site Code	: IN-UT-14	Altitude	: 1,800–7,000 msl
State	: Uttarakhand	Rainfall	: Not available
District	: Uttarkashi	Temperature	: Not available
Coordinates	: 31° 18' 34" N, 79° 05' 49" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Moist and Dry Himalayan Temperate Forests, Sub-alpine forest, Alpine Scrub and Pastures.
Area	: 239,000 ha		

IN-UT-14

IBA CRITERIA : A1 (Threatened species), A2 (Endemic Bird Area 130: Western Himalayas)

PROTECTION STATUS: National Park, established in September 1989.



GENERAL DESCRIPTION

The Gangotri National Park (GNP) lies in the upper catchment area of River Bhagirathi and derives its name from the famous Gangotri Temple, one of the four highly revered Hindu *dhams* (holy place). The National Park is located at a distance of c. 100 km from the district headquarters Uttarkashi. It covers a wide altitudinal gradient from about 2,500 m to 7,000 m (Satopanth peak) and is one of the largest protected areas of Uttarakhand. The varied topography and large altitudinal range in GNP provide a diversity of habitats for various floral and faunal assemblages. A major portion of GNP is rugged and snow-covered. The Gangotri glacier lies at the centre of the National Park and gives rise to River

Bhagirathi, called Ganga after Devprayag. Concerns have been raised that this glacier is fast receding due to various reasons including climate change.

GNP has a relatively good forest cover and the vegetation types vary from Himalayan Moist Temperate Forests to Alpine scrub and pastures. As elsewhere in the Himalaya, the Himalayan Moist Temperate Forests are dominated mostly by oaks or conifers. Ban Oak *Quercus leucotrichophora* dominates the lower altitude areas (1,800 m to 2,200 m) and is usually associated with *Rhododendron arboreum*, *Ilex diphyrena*, and *Lyonia ovalifolia*. Moru Oak *Quercus floribunda* with its associates, namely *Aesculus indica* and *Acer* spp., dominates the middle altitudes (2,200 to 2,500 m). Kharsu

Oak *Quercus semecarpifolia*, sometimes in almost pure stands (which are rare in case of Moru Oak), dominates the higher altitude regions (>2,500 m). At some places, especially along water channels and mesic areas, *Aesculus indica*, *Acer* spp., *Pyrus lanata*, and *Juglans regia* gain dominance over oaks. At lower altitudes (<2,200 m), along river valleys and landslide areas, Alder *Alnus nepalensis* forests, which are seral in nature, dominate the vegetation. In steep rocky areas around 2600 m with poor soil, the vegetation chiefly consists of *Cupressus torulosa*, often associated with *Cedrus deodara* and *Pinus wallichiana*. Himalayan Dry Temperate Forests are represented by Deodar *Cedrus deodara*-dominated stands around 2,500 m.

These forests have been heavily exploited in the past for timber and wood for railway sleepers. Needle-leaf Forests dominated by *Abies pindrow* with *Picea smithiana* are frequent between 2,600 m to 3,000 m. Stands of Blue Pine *Pinus wallichiana* are also present in the area and can occasionally be found up to 3,400 m.

The Sub-alpine zone, usually above 3,000 m, is dominated by *Quercus semecarpifolia*, *Abies pindrow*, and *Taxus baccata*, with other broadleaf species. The *krumholtz* zone (stunted forest) above 3,300 m dominated by *Rhododendron campanulatum* and *Betula utilis* along with *Sorbus foliolosa* is quite distinct in the areas where anthropogenic pressures in the past were less. This zone represents the tree limit and gives way to beautiful alpine pastures or meadows, locally called *bugyal*. These meadows are a storehouse of many rare and threatened medicinal plants. Important species include *Aconitum heterophyllum*, *Dactylorhiza hatagirea*, *Picrorhiza kurroa*, and *Jurinea dolomiacea*.

The rich floral value of the park has resulted in the naming of many places based on them, such as Chirbasa (area dominated by *Pinus wallichiana*, locally called *chir*) and Bhojbasa (area dominated by *Betula utilis*, locally called *bhoj*). Gangotri National Park provides refuge to sensitive Sub-alpine and Alpine vegetation, which is being degraded in many parts of the Himalaya due to overuse by man.

Apart from representing the west Himalayan ecosystem, this national park also has some peculiarities. The boundary in the north and northeast forms the international boundary with China. This part represents the Trans-Himalayan ecosystem and species such as *Thylacospermum* sp., and *Lamium rhomboideum* characteristic of cold arid regions, are found here. Similarly, though pure patches of *Taxus baccata* (Yew, locally called *thuner*) are rare, the area above Sukki village harbours a pure stand of *thuner*. GNP also forms a corridor between Govind National Park and Kedarnath Wildlife Sanctuary. Taken together, these three protected areas form a very large contiguous conservation unit.

AVIFAUNA

Little information is available on the birds of GNP,

VULNERABLE

Cheer Pheasant	<i>Catreus wallichii</i>
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ENDEMIC BIRD AREA 128: WESTERN HIMALAYA

Cheer Pheasant	<i>Catreus wallichii</i>
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BIOME 5: EURASIAN HIGH MONTANE (ALPINE AND TIBETAN)

Himalayan Vulture	<i>Gyps himalayensis</i>
Himalayan Snowcock	<i>Tetraogallus himalayensis</i>
Alpine Accentor	<i>Prunella collaris</i>

BIOME 7: HIMALAYAN TEMPERATE FOREST

Himalayan Rubythroat	<i>Luscinia pectoralis</i>
Hill Partridge	<i>Arborophila torqueola</i>
Koklass Pheasant	<i>Pucrasia macrolopha</i>
Himalayan Monal	<i>Lophophorus impejanus</i>
Speckled Woodpigeon	<i>Columba hodgsonii</i>
Himalayan Woodpecker	<i>Dendrocopos himalayensis</i>
White-collared Blackbird	<i>Turdus albocinctus</i>
Blue-capped Redstart	<i>Phoenicurus caeruleocephala</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Streaked Laughingthrush	<i>Garrulax lineatus</i>
Rufous Sibia	<i>Heterophasia capistrata</i>
Buff-barred Leaf-warbler	<i>Phylloscopus pulcher</i>
Ashy-throated Warbler	<i>Phylloscopus maculipennis</i>
Large-billed Leaf-warbler	<i>Phylloscopus magnirostris</i>
Western Crowned Warbler	<i>Phylloscopus occipitalis</i>
Rufous-gorgeted Flycatcher	<i>Ficedula strophilata</i>
Snowy-browed Flycatcher	<i>Ficedula hyperythra</i>
Ultramarine Flycatcher	<i>Ficedula superciliosa</i>
Slaty-blue Flycatcher	<i>Ficedula tricolor</i>
Rufous-bellied Niltava	<i>Niltava sundara</i>
Coal Tit	<i>Parus ater</i>
Grey Crested Tit	<i>Parus dichrous</i>
Green-backed Tit	<i>Parus monticolus</i>
Yellow-browed Tit	<i>Sylviparus modestus</i>
White-tailed Nuthatch	<i>Sitta himalayensis</i>
Bar-tailed Treecreeper	<i>Certhia himalayana</i>
Yellow-breasted Greenfinch	<i>Carduelis spinoides</i>
Pink-browed Rosefinch	<i>Carpodacus rodochroa</i>
Gold-billed Magpie	<i>Urocissa flavirostris</i>

though the presence of galliformes such as Common Hill-partridge *Arborophila torqueola*, Kaleej Pheasant *Lophura leucomelanos*, Koklass Pheasant *Pucrasia macrolopha*, Monal Pheasant *Lophophorus impejanus*, and Himalayan Snowcock *Tetraogallus himalayensis* is recorded. Presence of Cheer Pheasant *Catreus wallichii* in the Chir Pine *Pinus roxburghii* forests adjacent to GNP has been reported by local people and Nepali labourers, which needs to be confirmed. Judging by the altitudinal range, diversity of forests, and large area, this IBA is likely to hold a very good representation of West Himalayan avifauna.

OTHER KEY FAUNA

The Park is home to diverse Himalayan fauna. Some Threatened species include Himalayan Musk Deer *Moschus leucogaster*, Blue Sheep *Pseudois nayaur*, Himalayan Brown Goral *Naemorhedus goral*, Sambar *Rusa unicolor*, Himalayan Serow *Capricornis thar*, and Himalayan Tahr *Hemitragus jemlahicus*. The major carnivores inhabiting the area include the Snow Leopard *Panthera uncia* and Leopard



DHIRTIMAN MUKHERJEE

The Gangotri National Park lies in the upper catchment area of River Bhagirathi and derives its name from the famous Gangotri Temple. The vegetation types vary from Himalayan Moist Temperate Forests to Alpine scrub and pastures

Panthera pardus. Dominant small carnivores include the Red Fox *Vulpes vulpes*, Himalayan Yellow-throated Marten *Martes flavigula*, and Himalayan Weasel *Mustela sibirica*. Asiatic Black Bear *Ursus thibetanus* and Wild Boar *Sus scrofa* are also common. Pika or Mouse Hare *Ochotona roylei* is quite common in the sub-alpine and alpine zones.

LAND USE

- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Livestock grazing
- Collection of medicinal plants
- Disturbance to birds (poaching, killing, trapping)

The conservation issues related to this IBA are no different from other protected areas of the Himalaya.

Poaching of wildlife and illegal extraction of medicinal plants occur in the interior and less visited areas. Though religious sentiments attached to the Gangotri shrine and frequent traffic during summer curbs illegal activities, certain species are vulnerable to poaching during winter. Grazing by domestic livestock and migratory graziers lead to the degradation of sensitive sub-alpine forests and meadows in some areas. Increased, unmanaged, and concentrated tourism has also taken its toll. What impact(s) the Tehri Dam (constructed at Tehri, in the lower catchments of River Bhagirathi) will have on this IBA (that is located in the upper catchments of River Bhagirathi) is not known.

KEY CONTRIBUTORS

Sanjay Uniyal, Gopal S. Rawat, Dhananjai Mohan, Rajah Jayapal

JHILMIL JHEEL CONSERVATION RESERVE

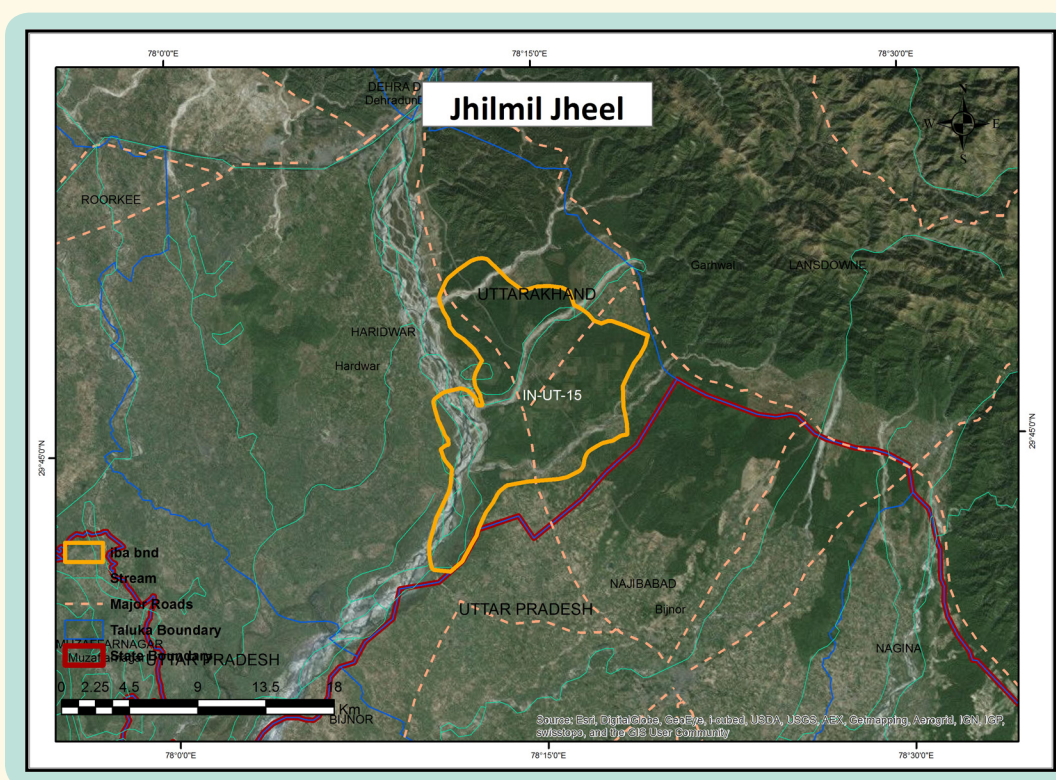
IN-UT-15

IBA Site Code	: IN-UT-15
Administrative Region	: Uttarakhand
(State)	
District	: Haridwar
Coordinates	: 29° 32' to 29° 50'N, 78° to 78° 15' E
Ownership	: State
Area	: 3,800 ha (Reserve Forest)

Altitude	: 200–250 msl
Rainfall	: 1,800 mm
Temperature	: 2 °C to 45 °C
Biogeographic Zone	: Terai, Lower Himalaya
Habitats	: Northern Moist Deciduous Forest, Mixed Forest, Riverine Forest, Terai grassland

IBA CRITERIA : A1 (Threatened species)

PROTECTION STATUS: Conservation Reserve, declared August 5, 2005.



GENERAL DESCRIPTION

Jhilmil Jheel is a saucer-shaped wetland situated on the left bank of River Ganga in Chiriyapur Forest Range of Haridwar Forest Division, Haridwar district. Being the only wetland in the area of its size that remains green and productive throughout the year, it attracts graziers from neighboring areas during the summer and is intensively grazed from March to June. It is located between the Haridwar-Najibabad Highway and the natural course of the Ganga, which flows south of it in Chiriyapur Range. The jheel is connected to the Ganga and is surrounded by the reserve forest of Chiriyapur Range. A number of small rivulets emerge from the woodland and discharge into Jhilmil Jheel, which finally drains into the Ganga. Hence most of the

cultivable land around Jhilmil Jheel has a high water table, and farmers are unable to cultivate it for more than six to seven months. Jhilmil Jheel also receives water from the northerly formations of the Shivaliks in Chiriyapur Range, or even further beyond, as underground streams as well as from flood waters of River Ganga (Sinha *et al.* 2007a).

Jhilmil Jheel came into the limelight due to the discovery of a small population (34 individuals) of globally Threatened Swamp Deer *Rucervus duvaucelii duvaucelii* on February 1, 2005 (Sinha & Chandola 2006). The Uttarakhand Forest Department soon swung into action and took conservation measures. On August 14, 2005, Professor A.P.J. Abdul Kalam, President of India dedicated this area as a Conservation Reserve for Swamp Deer,

along with Asan Wetland Conservation Reserve for birds in Uttarakhand.

At the same time, the Swamp Deer was well-known to the local villagers, who are strict vegetarians and do not kill any animal. The small population of Swamp Deer, now numbering more than 200, was surviving only because of their support. Tantpur, known earlier as Dudhiya Grant, is the only village adjacent to Jhilmil Jheel. The village came into existence only after the 1950s, and the community consists mostly of farmers from Punjab, Himachal Pradesh, and Garhwal division. The villagers mainly cultivate sugarcane, wheat, and paddy. This area is inundated during the four-month long monsoon, so the farmers get limited months for active cultivation and are willing to be relocated (Sinha *et al.* 2007a, b).

AVIFAUNA

A total of 160 species of birds was recorded till November, 2007 in the conservation reserve area, including both resident and migratory birds (Sinha *et al.* 2007b). Although Swamp Francolin *Francolinus gularis* has been mentioned in the checklist, there is no authentic record of its presence. The habitat is quite suitable and the possibility of reintroducing it in this IBA can be explored. The surrounding sugarcane fields can provide addition cover to this Vulnerable species. It has been shown that Swamp Francolin can live in a mosaic of natural wet grasslands and sugarcane fields (Iqbal *et al.* 2003).

Some interesting wet grassland species recorded till now are Bristled Grassbird *Chaetornis striata* (VU), Striated Grassbird *Megalurus palustris*, Rufous-rumped Grassbird *Graminicola bengalensis* (NT), Yellow-bellied Prinia *Prinia flaventriss*, Lesser Coucal *Centropus toulou*, White-tailed Lapwing *Vanellus leucurus* (winter visitor), and White-tailed

CRITICALLY ENDANGERED

White-rumped Vulture *Gyps bengalensis*

ENDANGERED

Egyptian Vulture *Neophron percnopterus*
Black-bellied Tern *Sterna acuticauda*

VULNERABLE

Bristled Grassbird *Chaetornis striatus*

NEAR THREATENED

Black-necked Stork *Ephippiorhynchus asiaticus*
Lesser Adjutant *Leptoptilos javanicus*
Great Pied Hornbill *Buceros bicornis*
River Tern *Sterna aurantia*
Rufous-rumped Grassbird *Graminicola bengalensis*

Stonechat *Saxicola leucura*.

Occasionally, White-rumped Vulture *Gyps bengalensis* is seen. But there is no authentic record of Slender-billed Vulture *Gyps tenuirostris*, although the area lies within its distribution range. Similarly, Red-headed Vulture *Aegypius calvus* has not been reported from Jhilmil Jheel, although it is found in other IBAs in the *terai* and *bhabhar* areas of the state.

OTHER KEY FAUNA

Besides the flagship species, Swamp Deer, this IBA has Tiger *Panthera tigris*, Leopard *P. pardus*, Asiatic Elephant *Elephas maximus*, Sambar *Rusa bicolor*, Cheetal *Axis axis*, Barking Deer or Indian Muntjac *Muntiacus muntjak*, Hog Deer *Axis porcinus*, Sloth Bear *Melurus ursinus*, Nilgai *Boselaphus tragocamelus*, and Wild Boar *Sus scrofa*. Lesser carnivores are represented by Golden Jackal *Canis aureus*, Jungle Cat *Felis chaus*, Small Indian Civet *Viverricula indica*, Himalayan Yellow-throated Marten *Martes flavigula*, and Striped Hyaena *Hyaena hyaena*. Terai Langur *Semnopithecus hector* and Rhesus Macaque *Macaca mulatta*



Tantwala Village adjacent to Jhilmil Jheel Conservation Reserve



DHIRTIMAN MUKHERJEE

Thanks to good protection by villagers and Forest Department, the number of Swamp Deer *Rucervus duvaucelli duvaucelli* has increased to more than 200 individuals in Jhilmil Jheel

are found in the conservation reserve.

Reptiles are represented by Indian Rock Python *Python molurus*, Common Krait *Bungarus caeruleus*, Banded Krait *B. fasciatus*, Indian Cobra *Naja naja*, and Monitor Lizard *Varanus bengalensis*. Marsh Crocodile *Crocodylus palustris* and three species of turtles are also found along the banks of River Ganga.

Plant diversity in Jhilmil Taal is very rich. Till now 206 species of plants, including 99 herbs, 28 shrubs, 72 trees, and seven climbers, belonging to 67 families, have been documented.

LAND USE

- Conservation in the reserve
- Cultivation in immediate vicinity

THREAT AND CONSERVATION ISSUES

A small building complex has been proposed as interpretation centre in the Rasiabadh campus. Inputs will be provided in according to the priorities and needs. A training and awareness programme will be conducted for the forest staff and young people of the villages to work independently in the wildlife tourism in limited way. Although grazing has been considerably reduced, it remains a management challenge. A small mineral water factory is located next to the wetland which keeps drawing up underground water. This may have negative influence on the hydrology of the area.

Jhilmil Jheel is flanked by Tantar village to the west, which has 130 families of farmers living within an area of 303.265 ha. The villagers strongly support conservation of Swamp Deer in Jhilmil Jheel. Repeated interaction with them has revealed that they are keen to move out of the area and get resettled elsewhere, mainly because this area is not ideal for year-round cultivation, unlike other parts of the Terai (Sinha *et al.* 2007a,b).

KEY CONTRIBUTORS

S.P. Sinha, Bitapi Sinha, Dhananjai Mohan.

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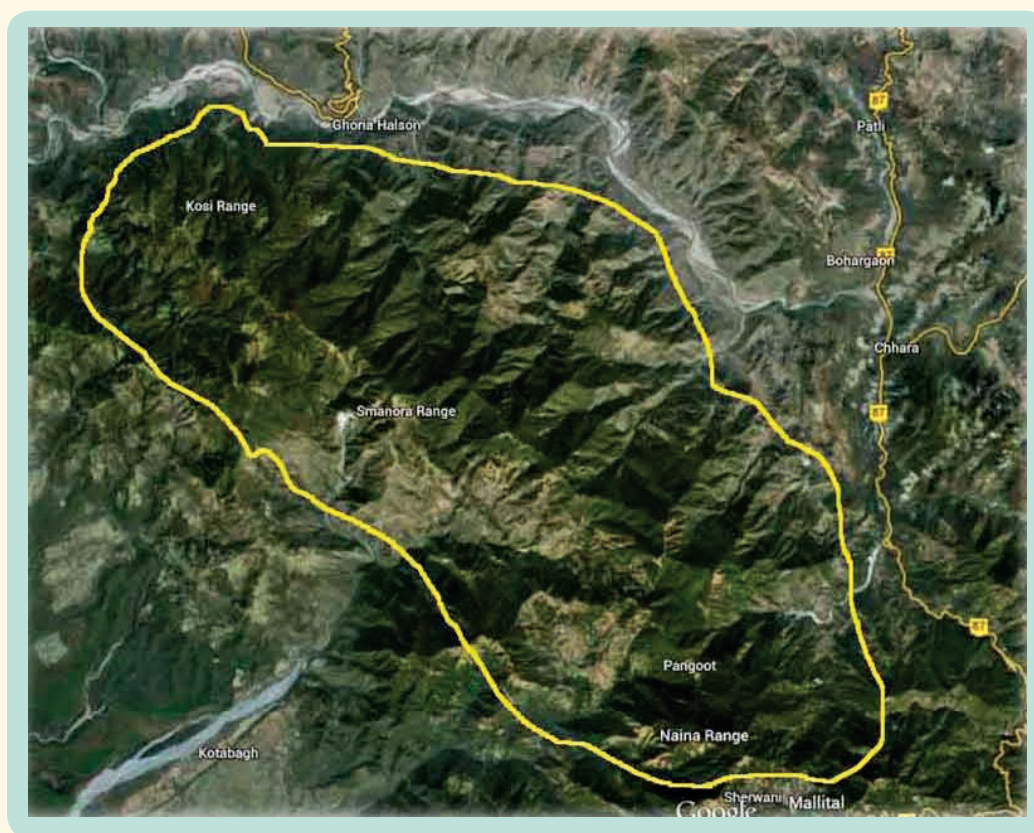
NAINA DEVI HIMALAYAN BIRD CONSERVATION RESERVE

IN-UT-16

IBA Site Code	: IN-UT-16	Altitude	: 1000-2600 msl
Administrative Region (State)	: Uttarakhand	Rainfall	: 1,400 mm
District	: Nainital	Temperature	: -5 °C to 40 °C
Coordinates	: 29° 24' to 29° 31' N and 79° 16" to 79° 29" N	Biogeographic Zone	: Himalaya
Ownership	: Government	Habitats	: Sub-Tropical Pine Forests, Himalayan Moist Temperate Forests, Tropical Dry Deciduous Forest, Tropical Moist Deciduous Forest
Area	: 11191.9 ha		

IBA CRITERIA : A1 (Threatened species), **Biome species** (?)

PROTECTION STATUS: Conservation Reserve, declared on August 5, 2005



GENERAL DESCRIPTION

The Naina Devi Himalayan Bird Conservation Reserve of 11191.9 ha consists of largely intact forest in Nainital and Kosi ranges of Nainital Forest Division. The area lies for about 30 km on the Kosi river. The Reserve is close to Corbett National Park and Nandhour Wildlife Sanctuary (both IBA), and it also connects with the larger Corbett Landscape and forests of Ramnagar-Haldwani region, extending even up to Nepal. There is no village inside the proposed Conservation Reserve but three revenue *chaks* or villages, Churani, Pali and Sukha, lie within the boundary

of the proposed larger reserve. Eleven revenue villages are located on the periphery. The rights of the people inside the Reserve have been settled. The forests of the Conservation Reserve have been broadly classified into Tropical Pine Forests and Himalayan Moist Temperate Forests. There are some stretches of Tropical Moist Deciduous Forest, Tropical Fresh Water Swamp Forest and Tropical Dry Deciduous Forests. These forest types overlap each other considerably and their distribution is conditioned to a varying extent by local conditions, especially soil, moisture, and other micro-climatic as well as biotic factors (Anon. 2014).

CRITICALLY ENDANGERED

Himalayan Quail (Extinct?)	<i>Ophrysia superciliosa</i>
White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Cheer Pheasant	<i>Catreus wallichi</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Grey-crowned Prinia	<i>Prinia cinereocapilla</i>

NEAR THREATENED

Bearded Vulture	<i>Gypaetus barbatus</i>
Himalayan Griffon	<i>Gyps himalayensis</i>

According to Forest Department sources, the Conservation Reserve supports some of the most pristine Oak forests of the State of Uttarakhand, which besides being a good habitat for high altitude animal/bird species, also renders many environmental services which are unique to the Oak forests. The important Oak species of the Reserve are Banj Oak *Quercus incan*, Tilonj *Q. dilatata*, Rianj *Q. lanuginose*, Phaliant *Q. glauca*, and Kharsu, the Brown Oak *Q. semecarpifolia*. In the lower reaches and the southern slopes, Chir *Pinus roxburghii* is the main species. Along the streams, broad-leaved associates of Pine, for example *Rhododendron* spp, *Carpinus* spp, *Toona serrata*, *Erithrina suberosa* and many species of *Ficus* can be seen. Deodaar *Cedrus deodara*, Surai *Cupressus torulosa*, Utis *Alnus nepalensis*, *Acer pictum*, *Aesculus indica*, *Prunus cerasoides* are some of the important tree species found in the region. The forests also harbour many species of shrubs and herbs, climbers, bamboos, parasites, grasses and lichens (Anon. 2014).

AVIFAUNA

The area of the proposed Conservation Reserve is mainly famous for its diverse avifauna. More than 200 species of birds, both resident and migratory, have been reported from the area (Anon. 2014, Dhananjai Mohan *pers. comm.* 2014). This area is famous for Vulnerable Cheer Pheasant *Catreus wallichi*. Critically Endangered Red-headed Vulture *Aegypius calvus* is frequently seen.

An important species about which not much is known is the Grey-crowned Prinia *Prinia cinereocapilla*. It is categorised as Vulnerable by BirdLife International and IUCN.

The Himalayan Quail had occurred in the foothills of the western Himalaya at Nainital in Kumaon form areas very close to the Conservation Reserve. Recent Indian records seem unlikely given that the area is well populated, the habitat extensively altered by human activity and recent surveys have not located birds. During October 2014, a special operation called 'Mission Himalayan Quail' was initiated with the object to identify and locate this bird. During this Mission, the Kilbury, Pangot and Vinayak areas were identified as a potential habitat for the Himalayan Quail which are now part of this IBA.

Ten species of woodpeckers are found in this IBA, indicating the health of the forests. They are Speckled Piculet *Picumnus innominatus*, Rufous-bellied Woodpecker *Hypopicus hyperythrus*, Grey-capped Pygmy Woodpecker *Dendrocopos canicapillus*, Striped-breasted Woodpecker *Dendrocopos atratus*, Brown-fronted Woodpecker *Dendrocopos auriceps*, Himalayan Woodpecker *Dendrocopos himalayensis*, Greater Yellow-naped Woodpecker *Picus flavinucha*, Streaked-throated Woodpecker *Picus xanthopygaeus*, Scally-bellied



Perhaps the best place to see Grey-crowned Prinia *Prinia cinereocapilla* is this IBA. Not much is known about the ecology of this Vulnerable species



NEERAJ SRIVASTAVA

Various types of forests are found in this Conservation Reserve from Tropical Moist to Tropical Dry Deciduous, thus creating good habitat for more than 200 bird species that have been identified till now. Detailed research will increase the species list. Even now nine globally Threatened species have been reported

Woodpecker *Picus squamatus*, and Grey-headed Woodpecker *Picus canus*.

OTHER KEY FAUNA

Being contiguous with Corbett National Park, Nandhour Wildlife Sanctuary and reserve forests, the IBA is rich in other wildlife. Besides Tiger *Panthera tigris* and Leopard *Panthera pardus*, it has Himalayan Black Bear *Ursus thibetanus*, Yellow-throated Marten *Martes flavigula* and many small cat species. Asiatic Elephant *Elephas maximus* is also found in the lower reaches. Among the ungulates, Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, Himalayan Brown Goral *Nemorhaedus goral*, Himalayan Serow *Capricornis thar* and Wild Boar *Sus scrofa* are often seen. Red Giant Flying Squirrel *Petaurista petaurista* is found in the interior of the forests, away from human habitation. Rhesus Macaque *Macaca mulatta* is widespread and a great menace in the villages, along with Himalayan Langur *Semnopithecus shistaceus*.

LAND USE

- Forest conservation
- Conservation education

THREAT AND CONSERVATION ISSUES

The area has been a well-known tourist place, attracting visitors who flock to the popular hill station of Nainital. Many

tourists visit the area as a quite forested destination from where snow-peaks can be easily seen. In the last couple of decades certain locations like Kilbury, Pangot and Vinayak have earned the reputation of being outstanding Himalayan bird-watching destinations for temperate zone birds of the Himalaya, and a few private facilities have already come up here, some of which seem to be commercially-oriented. Presently there are no regulations for tourists and resort owners. But the Nainital Forest Division is trying to introduce some restraints in this newly-declared (7th march 2015) Conservation Reserve to ensure healthy bird-based eco-tourism with the active involvement of the local people. The typical forest problems of poaching, illicit felling or encroachment are nearly absent in the area.

Considering the recorded presence of a viable breeding population of Cheer Pheasant and other endangered Himalayan bird species, there is an urgent need to strengthen conservation with an emphasis on promoting and preserving biodiversity while accommodating sustainable human use of natural resources by bona fide local communities.

KEY CONTRIBUTORS

Tejasvini Patil, Dhananjai Mohan

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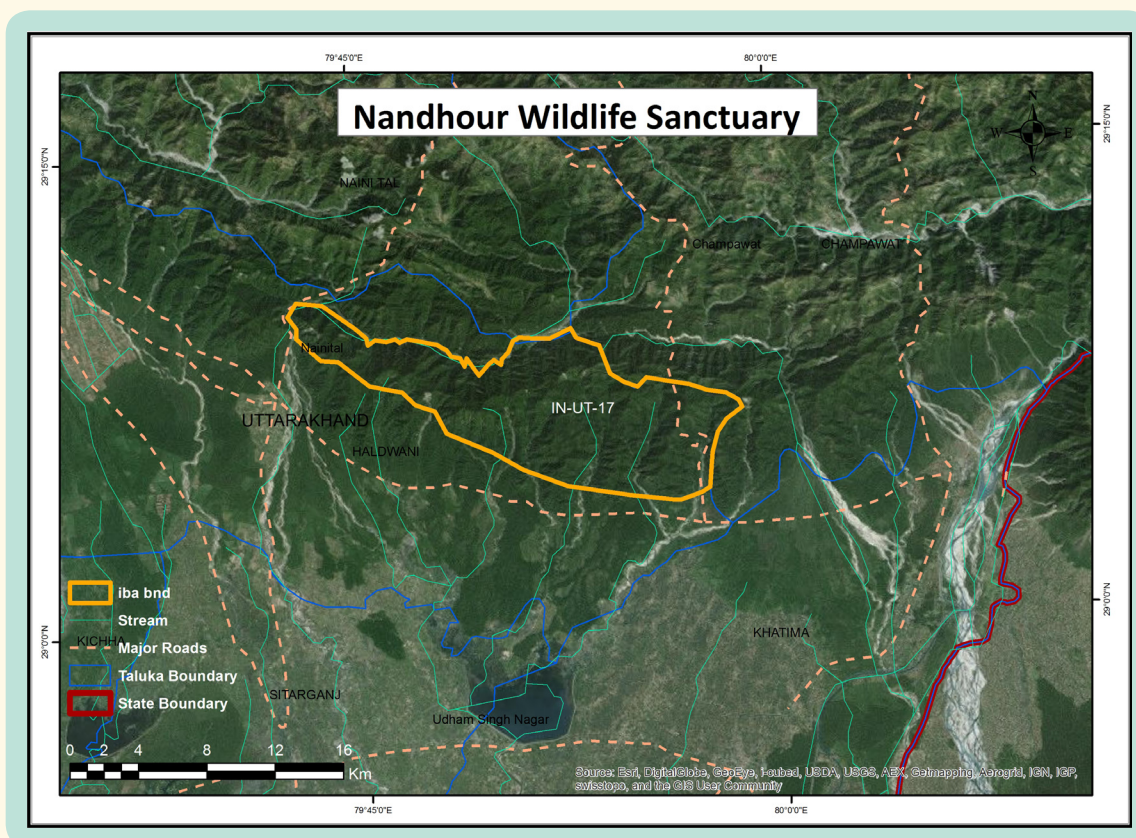
NANDHOUR WILDLIFE SANCTUARY

IN-UT-17

IBA Site Code	: IN-UT-17	Area	: 270 sq. km
Administrative Region	: Uttarakhand	Altitude	: 400–1,210 msl
(State)		Rainfall	: 1,400 mm
District	: Nainital	Temperature	: 2 °C to 47 °C
Coordinates	: 29°09'00 N and 78°46'17 E	Biogeographic Zone	: Himalaya
Ownership	: Government	Habitats	: Tropical Dry Deciduous Forest, Tropical Moist Deciduous Forest

IBA CRITERIA : A1 (Threatened species)

PROTECTION STATUS: Wildlife Sanctuary established on December 14, 2012.



GENERAL DESCRIPTION

The Nandhour landscape, between Rivers Gola and Sharda in Haldwani Forest Division, supports rich biodiversity and has always been important area as a potential protected area. The Nandhour area is the sub-landscape flanked by River Gola in the west and River Sharda in the east, and intersected by River Nandhaur which flows east to west in the northern part and then turns south to bisect the landscape, before disappearing in the *terai* area. Though there are many rivers in this landscape, Nandhour is the most significant, and also the only one which is perennial with substantial water. It also has large stands of undisturbed forest, which have virtually no habitation. This IBA is a critical link for

wildlife populations to move across the Terai Arc Landscape (Verma 2011).

The area supports a variety of flora and fauna, with adequate supply of food and perennial water sources. It is also part of Shivalik Elephant Reserve, declared by the Government of Uttarakhand in 2002.

The major part of Nandhour Wildlife Sanctuary lies in Haldwani Forest Division, while some parts in the north-eastern side lie in Champawat Forest Division (Verma 2011).

Nandhour landscape is the only link between the eastern forests of Terai Arc Landscape (TAL), for example Bramhadev and Suklaphanta Wildlife Reserves of Nepal,



DHANANJAY MOHAN

Though there are many rivers in Nandhour Wildlife Sanctuary, the river Nandhour is the most significant, and also the only one which is perennial with substantial water. More than 200 bird species have been identified from this new IBA

and the western forests of Ramnagar and Terai Central Forest Division.

The Nandhour landscape has more than 100 species of trees, 30 species of shrubs, and 20 species of climbers and grasses. It also has 27 different forest types and sub-types when classified according to the Champion & Seth (1969) forest classification. The area bears predominantly Sal *Shorea robusta* forest, covering about 70% of its area. It also has Shisham *Dalbergia sissoo*, Bamboo, Teak *Tectona grandis*, Chir Pine *Pinus roxburghii*, and riverine forest. Since the area lies in the *bhabhar* belt, it is relatively dry. However, the Nandhour river valley has water throughout the year, and the best forests in the landscape are present along the river.

AVIFAUNA

Till now, 205 species of birds have been reported from Nandhour WLS, and more are likely to be found. While there are confirmed sightings of White-rumped Vulture *Gyps bengalensis*, Slender-billed Vulture *G. tenuirostris* is also likely to occur (Dhananjai Mohan, *in litt.* 2014). As nearly 70% of the area is covered with Sal forest, Great

Slaty Woodpecker *Mulleripicus pulverulentus* is frequently seen, either singly or in small parties. Studies reveal that this large woodpecker prefers mature unlogged forest (Lammertink 2004).

Since Nandhour lies in the easternmost part of the state of Uttarakhand, it has the maximum affinity towards eastern Himalayan forests, which is strengthened by the

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>

NEAR THREATENED

Asian Woollyneck	<i>Ciconia episcopus</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Black-headed Ibis	<i>Threskiornis melanoccephala</i>
Cinereous Vulture	<i>Aegypius monachus</i>
River Lapwing	<i>Vanellus duvaucelli</i>
Great Pied Hornbill	<i>Buceros bicornis</i>



DHANANJAI MOHAN

Nandhour forest is a part of Terai Arc Landscape in India and Nepal

fact that it is the only area in the state where Red-headed Trogon *Harpactes erythrocephalus* has been sighted in recent years (Dhananjai Mohan, *pers obs* 2013). The perennial, unpolluted Nandhour river attracts the fish-eating raptors and Pallas's Fish-eagle *Haliaeetus leucoryphus* and Lesser Fish-eagle *Ichthyophaga humilis* are regularly seen along it. River Lapwing *Vanellus duvaucelli* is also frequent along Nandhour. Great Pied Hornbill *Buceros bicornis* is also regularly seen in the valley and are probably breeding here regularly. Red-headed Vultures *Aegypius calvus* are also regularly seen in the sanctuary.

OTHER KEY FAUNA

The Nandhour landscape houses a very healthy population of Asiatic Elephant *Elephas maximus*, Leopard *Panthera pardus*, Asiatic Black Bear *Ursus thibetanus* and Sloth Bear *Melursus ursinus*. It is also home to Tiger *Panthera tigris*, whose population is recovering now. Other species found are Sambar *Rusa unicolor*, Cheetal *Axis axis*, Barking Deer *Muntiacus muntjak*, and an occasional Nilgai *Boselaphus tragocamelus* in low flat areas.

Sixteen species of reptiles have been listed in government

documents (Verma 2011), including Indian Tent Turtle *Kachuga tentoria*, Elongated Tortoise *Indotestudo elongata*, King Cobra *Ophiophagus hannah*, and Russell's Viper *Daboia russelli*.

LAND USE

- Conservation
- Forestry
- Cultivation (outside the reserve)

THREATS AND CONSERVATION ISSUES

Poaching is the main threat, particularly for ungulates and large cats such as Tiger and Leopard.

KEY CONTRIBUTORS

Amit Verma, Dhananjai Mohan.

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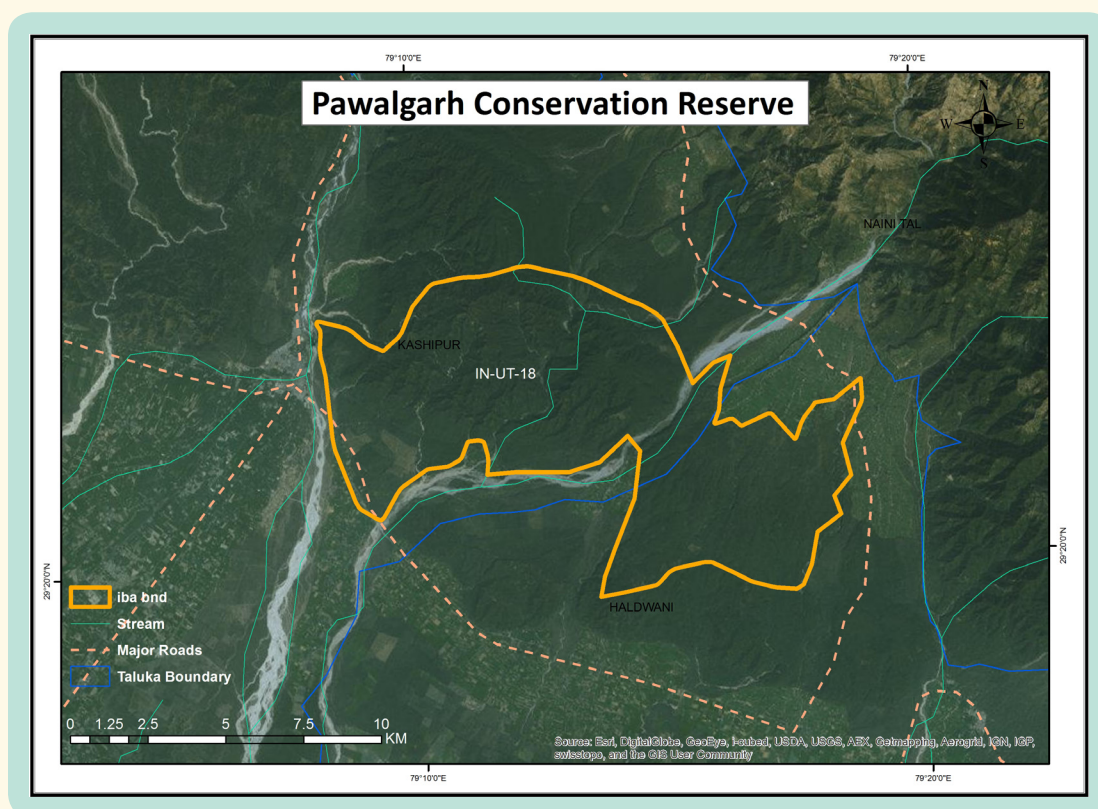
PAWALGARH CONSERVATION RESERVE

IN-UT-18

IBA Site Code	: IN-UT-18	Altitude	: 300–600 msl
Administrative Region (State)	: Uttarakhand	Rainfall	: 1600 mm
District	: Nainital	Temperature	: 2 °C to 47 °C
Coordinates	: 29° 42' N and 79° 21' E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Tropical Moist Deciduous Forest, Tropical Dry Deciduous Forest, Tropical Grassland
Area	: 5825 ha		

IBA CRITERIA : A1 (Threatened species).

PROTECTION STATUS: The Pawalgarh Conservation Reserve was officially notified on 14 December 2012.



GENERAL DESCRIPTION

The Pawalgarh Conservation Reserve is a newly declared Conservation Reserve in the beautiful, vast and rich forests of Ramnagar Forest Division in Nainital district which is a part of the *terai* landscape. It was notified on December, 14, 2012 and encompasses an area of 58.25 sq. km. The area was the hunting ground of Jim Corbett and many of his stories are set in this area. Sandani Gaja, a large grassland close to the riverine forests, is located 5 km southeast of Pawalgarh Forest Rest House, adjacent to the legal boundary of the conservation reserve. The reserve is primarily drained by the Dabka river and has prime forests of Sal and other species. The Baur river flows to the east of the area. The Kotabagh

plateau is marked by human inhabitation and agriculture, but the forest edges are rich in birdlife. The entire landscape in the backdrop of the Nainital range of mountains is a mosaic of Sal, mixed and riverine forests, grasslands, rocky river beds, human habitation and agriculture.

AVIFAUNA

The Pawalgarh Conservation Reserve is a good Himalayan bird habitat with varied habitat types to support the diversity of bird species. A recent checklist (2015) published by the Uttarakhand Forest Department lists 352 species of birds. The checklist is based on records compiled by Rajesh Panwar, Sanjay Sondhi, Raman Kumar,



The forests of Pawalgarh Conservation Reserve harbour nearly 352 bird species, including four globally Threatened and 11 Near Threatened species. It is also a very good representation of Biome-8 (Sino-Himalayan Subtropical Forest)

and Dhananjai Mohan and published by Ramnagar Forest Division. Seven species of vultures have been recorded here, namely, Red-headed Vulture *Aegypius calvus*, Slender-billed Vulture *Gyps tenuirostris*, Egyptian Vulture *Neophron percnopterus*, Cinereous Vulture *Aegypius monachus*, Bearded Vulture *Gypaetus barbatus* and Himalayan

Griffon *Gyps himalayensis*. Although Indian or Long-billed Vulture *Gyps indicus* is given in the checklist, it is not the distribution range of Long-billed Vulture (Rasmussen and Anderton 2005, 2012).

In February 2015, Great Slaty Woodpeckers *Mulleripicus pulverulentus*, Golden-spectacled Warbler *Seicercus burkii*, Steppe Eagle *Aquila nipalensis*, many Red-breasted Parakeets *Psittacula alexandri*, Oriental Pied Hornbills *Anthracoceros albirostris*, and River Lapwings *Vanellus duvaucelii* were seen (Raju Kasambe, pers. obs. 2015). Kasambe and Dudhe (unpubl.) sighted 93 species of birds during the Uttarakhand spring Bird Festival in February 2015.

Trails from Pawalgarh Forest Rest House to Sandani Gaja grassland, trail leading to Dabka valley, trail around Sitabani rest house and trail from Sitabani to Kyari village have become favourites among bird watchers as these are immensely fruitful and yield sighting of diverse species of birds.

OTHER KEY FAUNA

Most of the mammal species found in the landscape are also found in this IBA. Among the larger mammals, Tiger *Panthera tigris*, Leopard *P. pardus*, Asiatic Elephant *Elephas maximus*, Sambar *Rusa unicolor*, Cheetal *Axis axis*,

CRITICALLY ENDANGERED

Red-headed Vulture	<i>Aegypius calvus</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>
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NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Bearded Vulture	<i>Gypaetus barbatus</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
River Lapwing	<i>Vanellus duvaucelii</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Red-breasted Parakeet	<i>Psittacula alexandri</i>
Great Pied Hornbill	<i>Buceros bicornis</i>



With strategically located rest houses and easy accessibility, Pawalgarh is becoming a major birding destination

Hog Deer *Axis porcinus*, Barking Deer or Indian Muntjak *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Himalayan Brown Goral *Nemorhaedus goral*, and Golden Jackal *Canis aureus* are noteworthy. Interestingly, in the winter the Asiatic Black Bear *Ursus thibetanus* visits the northern part of the Reserve and Sloth Bears *Melursus ursinus* are resident in the southern portion of the Reserve. In addition to numerous species of amphibians and lizards, Rock Pythons *Python molurus* are frequently seen.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Conservation Reserve
- Livestock grazing
- Invasive species
- Forest fires
- Man-animal conflict
- Tourism

In 2014, the Uttarakhand Forest Department started an Uttarakhand Spring Bird Festival with an intention to hold it every year. As proposed, in February 2015, Pawalgarh hosted the bird festival once again. The yearly feature has started attracting a good number of tourists to the region. This activity is promoting homestays and local employment creation. The bird festival was organized with the help of many NGOs such as the Titli Trust, Nature Science Initiative, WWF, Rainbow Friends of Nature and Environment, BNHS, Kalpavriksh, Waste Warriors. Local guides are being trained in birdwatching.

KEY CONTRIBUTORS

Raju Kasambe, Sanjay Sondhi, Dhananjai Mohan, Rajesh Panwar,

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